PB90-153677

Superfund Record of Decision (EPA Region 1)
Auburn Road Landfill, Londenderry, NH
(Second Remedial Action), September 1989

(U.S.) Environmental Protection Agency, Washington, DC

29 Sep 89

U.S. Department of Commerce
National Technical Information Service

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16. Abstract (Limit: 200 words)

The Auburn Road Landfill site consists of four former land disposal areas on 200 acres of land in Londenderry, Rockingham County, New Hampshire. The four disposal areas, referred to as the Old Town Dump (3 acres), the Tire Dump (4 acres), the Solid Waste Area (6 acres), and the Septage Lagoon (1 acre), are sources of soil and ground water contamination at the site. Land bordering the site is occupied primarily by private residences, and includes wetlands, streams, and a pond. In 1979, after verifying that industrial wastes were being disposed of at the site, the State prohibited further disposal of drums. Since 1980, 69 monitoring wells have been installed and numerous test pits have been excavated at the site. In 1986 EPA removed approximately 1,000 drums of waste materials from the site, the majority being removed from the Old Town Dump area. The first operable unit for the site was completed in December 1987, when all residences identified as being potentially impacted by site ground water contamination were connected to a local public water supply. Concurrently the site owner erected a seven-foot high fence around the Old Town Dump, the Tire Dump, and the Solid Waste area. A second drum removal was conducted in October 1988 when EPA removed 16 drums from the Old Town Dump and 300 drums from the Tire Dump. This ROD represents the second and third operable units for the site and includes ground water remediation and reducing residual
(See Attached Sheet)

17. Document Analysis a. Descriptors
Record of Decision - Auburn Road Landfill, NH
Second Remedial Action - Final
Contaminated Media: soil, gw
Key Contaminants: VOCs (benzene, TCE, PCE), metals (arsenic, lead)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement

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20. Security Class (This Page) None

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See Instructions on Reverse

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Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R01-89/042
September 1989

EPA

Superfund Record of Decision:

Auburn Road Landfill, NH

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EPA/ROD/R01-89/042
Auburn Road Landfill, NH
Second Remedial Action - Final

16. Abstract (Continued)

soil contamination which is a contamination source to ground water. The primary contaminants of concern affecting the soil and ground water are VOCs including benzene, toluene, TCE, and PCE; and metals including arsenic and lead.

The selected remedial action for this site includes downgradient ground water pumping and onsite treatment using chemical coagulation and precipitation to remove metal contaminants and air stripping to remove VOCs, which will be collected in a vapor phase carbon adsorption system, followed by onsite discharge to recharge trenches; ground water monitoring; and placing a multilayered natural and synthetic cap over each source area. The estimated present worth cost for this remedial action is $24,100,000, which includes annual present worth O&M costs of $1,460,000.

NOTICE

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RECORD OF DECISION

Auburn Road Landfill
Londonderry, New Hampshire

STATEMENT OF PURPOSE

The Decision Document represents the selected remedial action for the Auburn Road Landfill Site in Londonderry, New Hampshire, developed in accordance with the Comprehensive Environmental Response, Compensation and liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Contingency Plan (NCP), 40 CFR Part 300 _et seq_., as amended. The Region I Administrator has been delegated the authority to approve this Record of Decision.

STATEMENT OF BASIS

This decision is based on the administrative record which has been developed in accordance with Section 113 (k) of CERCLA and which is available for public review at the Londonderry Public Library in Londonderry, New Hampshire and at the Region I Waste Management Division Records Center in Boston, Massachusetts. The attached index identifies the items which comprise the administrative record upon which the selection of the remedial action is based.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for the Auburn Road Landfill Site includes both source control and management of migration (or groundwater control) components to obtain a comprehensive remediation.

1. Management of Migration MM-2 (Operable Unit II)

The management of migration operable unit chosen, (MM-2), will include groundwater collection and treatment. Groundwater will be collected by using a combination of overburden and bedrock wells and overburden collection trenches. The collection system will be designed to recover contaminated groundwater immediately downgradient of each Site source area, along an established compliance boundary and off-site, north of the Whispering Pines Pond. Once extracted, groundwater will be treated through physical processes, to meet Federal and State drinking water standards prior to discharge to on-site recharge trenches located away from the source areas.

Contaminated groundwater will first be treated through chemical coagulation and precipitation to remove inorganic compounds (metals). Following treatment for the inorganics, the groundwater will be pumped to an air stripping tower. Air stripping removes organic contaminants from groundwater by accelerating the volatilization process. The contaminated air stream is then discharged to a vapor phase carbon adsorption unit prior to atmospheric discharge. If, after the air stripping process, the treated groundwater effluent still does not meet the Federal and State drinking water standards, it will be discharged to an activated carbon treatment unit for final treatment.

EPA has estimated that groundwater treatment will continue for six to ten years. This treatment period will allow for treating three to five complete pore volumes of groundwater from the overburden and shallow bedrock aquifer. Quarterly groundwater monitoring will be initiated during the remedial design phase and will continue through the post-remediation period, both on and off-site, to track the effectiveness of the collection and treatment process. The monitoring network will be established during remedial design.

2. Source Control SC-2 (Operable Unit III)

The Source Control Operable Unit, (SC-2), will consist of placing a natural and synthetic cap over the Town Dump, Tire Dump and Solid Waste Area. This operable unit may be implemented concurrently with groundwater treatment and will be accomplished with only minimal disturbance of existing waste material. At a minimum, this multilayered cap will consist of a vegetative topsoil layer, a subsurface drainage layer, and a low permeability layer (barrier) that will underlie the drainage layer. The vegetative layer will consist of topsoil (loam) that will support vegetation growth and facilitate drainage. This layer will protect the cap through soil stabilization and erosion control. Directly beneath the topsoil layer will be a layer of sandy soil that will promote sub-drainage of infiltrating precipitation and protect the underlying low-permeability layer. A synthetic liner composed of a high-density polyethylene material (HDPE) was chosen for the low-permeability layer. Because the current topography of the Auburn Road Site is not suitable for capping, grading and compaction will be required to form a proper sub-base for the cap. The final slope will be designed to remove surface irregularities, provide proper drainage, and prevent erosion. Grading of the Site will be accomplished with little or no disturbance of buried wastes.

DECLARATION

The selected remedy is protective of human health and the environment, attains federal and state requirements that are applicable or relevant and appropriate for this remedial action and is cost-effective. This remedy satisfies the statutory preference for remedies that utilize treatment as a principal element to reduce the toxicity, mobility, or volume of hazardous substances. In addition, this remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

Sept 29, 1989
Date

Paul Keough
Paul G. Keough, Acting
Regional Administrator

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ROD DECISION SUMMARY

I. SITE NAME, LOCATION AND DESCRIPTION

SITE NAME: Auburn Road Landfill Site

SITE LOCATION: Town of Londonderry, Rockingham County, New Hampshire

SITE DESCRIPTION:
The Auburn Road Landfill Site ("the Site") is located in the northeast corner of the Town of Londonderry, New Hampshire (Figure I-1). The Site consists of approximately 200 acres on which four disposal areas containing hazardous substances have been identified. The Old Town Dump, which is the oldest of the four source areas, consists of approximately three acres. The next oldest area is the Tire Dump which is approximately four acres followed by the Solid Waste area and Septage Lagoon which are approximately six acres and one acre, respectively.

The study area is approximately bounded by Auburn Road to the west, Old Derry Road to the south, State Highway 28 Bypass to the east, and the Londonderry-Auburn town line to the north. Figure I-2 depicts the general location of the study area of the Site.

There are numerous hills and mounds on and around the Site. Surface waters in the vicinity of the Site are numerous and varied (wetlands, three streams, one pond). Several brooks and streams drain the local area and flow in a general north, northeast direction through the Site. The unnamed brook on the eastern side of the Site joins with another unnamed brook that flows through the center of the Site. Downstream of this confluence, the stream flows to the north where a concrete dam has been installed, causing this stream to form the Whispering Pines Pond. The outflow of this pond passes though a sluice and several culverts until it discharges into Cohas Brook. Cohas Brook flows from the northeast toward the Site until it joins with the discharge from the pond. From this point, Cohas Brook flows to the northwest. This meandering brook is often slow flowing with a swampy shoreline.

Located in the northeastern portion of the study area is the Whispering Pines Mobile Home Park. The perimeter of the Site is surrounded to the south, east, and west by private residences.

A more detailed description of the Site can be found in Chapters 1 and 3 of the Remedial Investigation (RI) Report prepared by NUS Corporation (NUS) dated April 10, 1989.

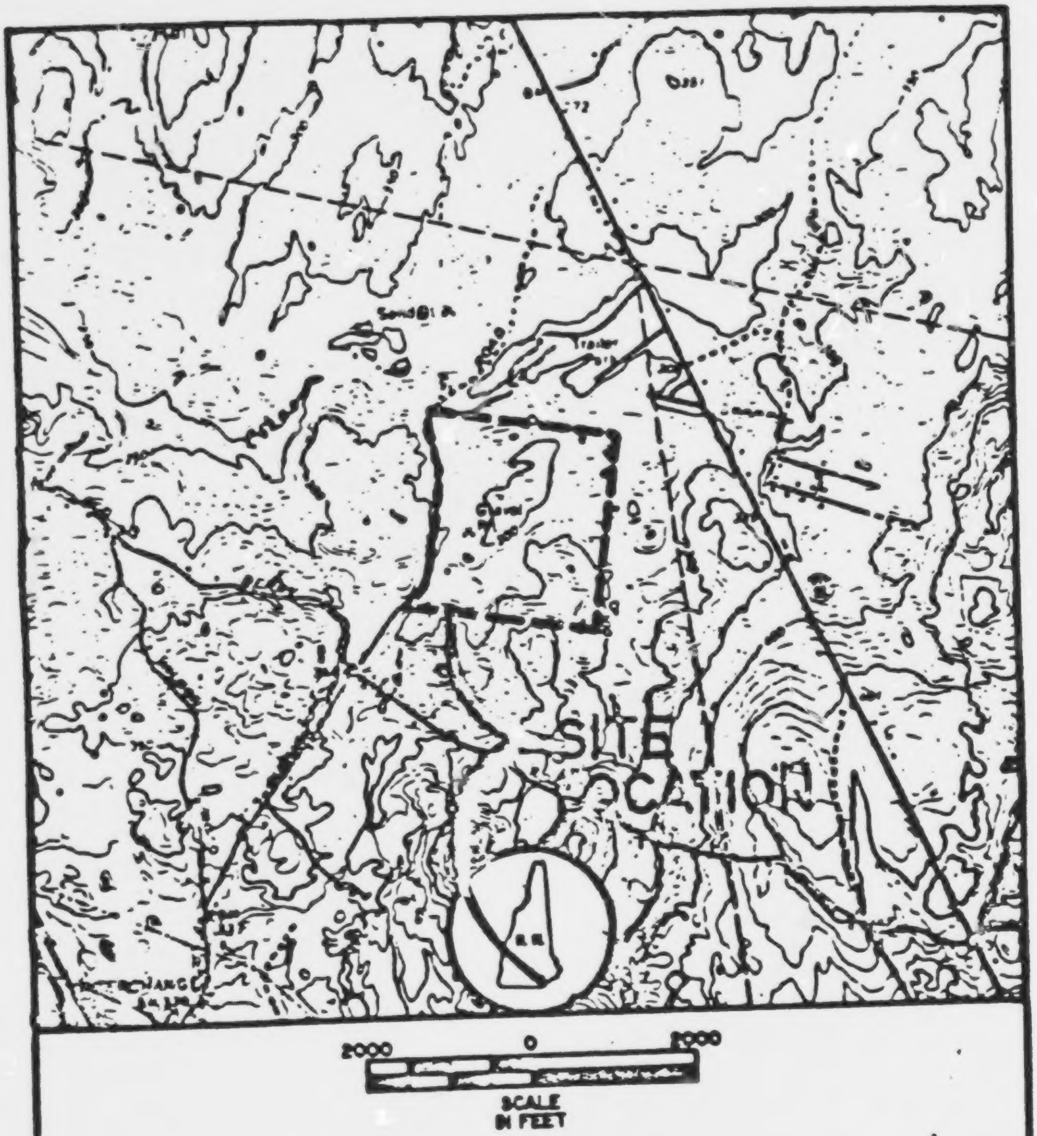
SITE LOCATION
2000
0
2000
SCALE IN FEET

FIGURE I-1
AUBURN ROAD
LANDFILL SITE
LONDONDERRY, NEW HAMPSHIRE

BASE MAP IS A PORTION OF THE U.S.G.S. DERRY, NH
QUADRANGLE 7.5 SERIES, 1968

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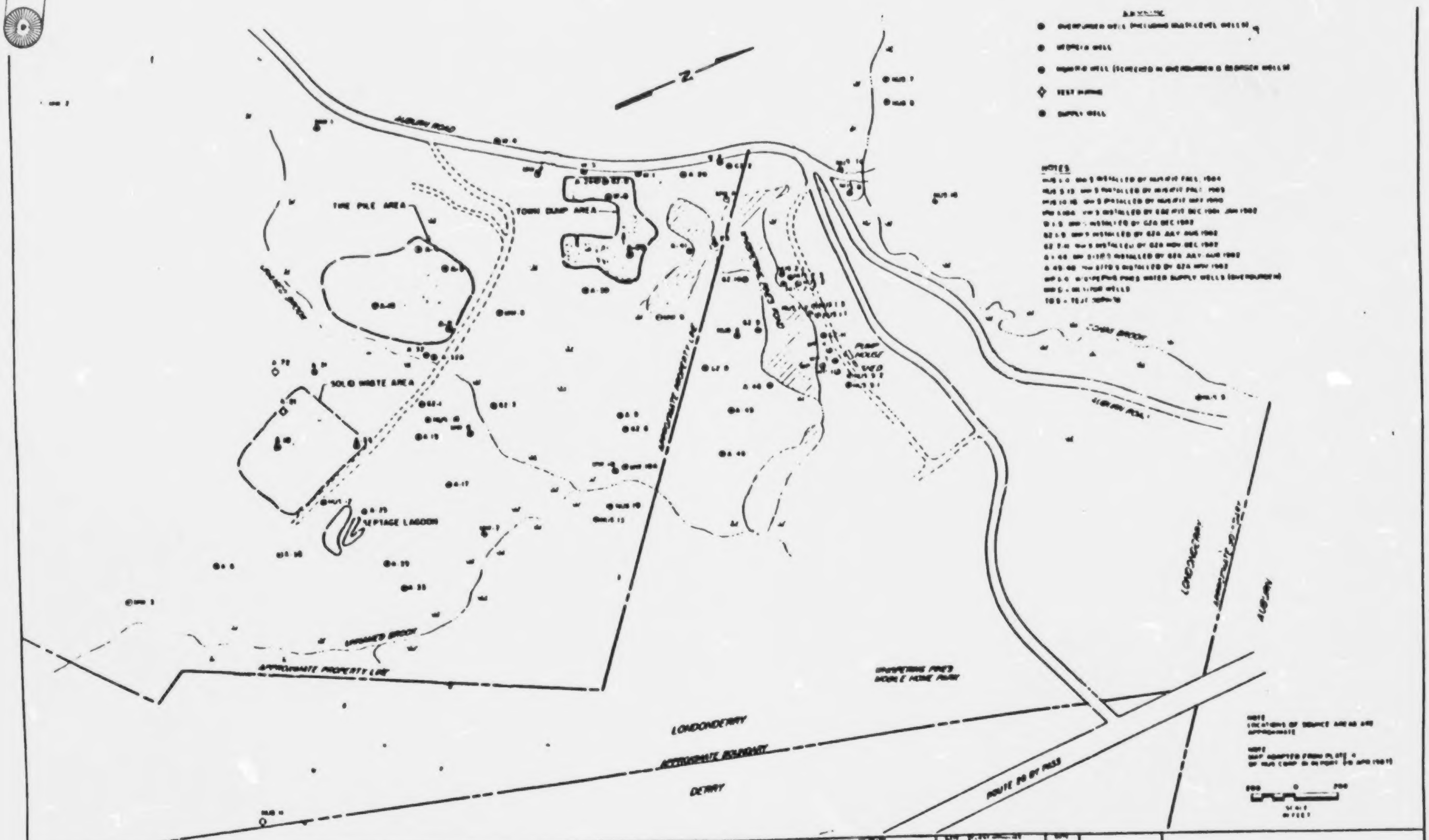

N
AUBURN ROAD
THE PILE AREA
TOWN DUMP AREA
SOLID WASTE AREA
SEPTAGE LAGOON
APPROXIMATE PROPERTY LINE
APPROXIMATE PROPERTY LINE
PUMP HOUSE
SHED
COHAS BROOK
AUBURN ROAD
LONDONDERRY
APPROXIMATE BOUNDARY
AUBURN
LONDONDERRY
APPROXIMATE BOUNDARY
DERRY
ROUTE 93 BY PASS
NOTES
SCALE IN FEET

AUBURN ROAD
LANDFILL SITE
LONDONDERRY, NEW HAMPSHIRE

SITE MAP

Figure I-2

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Response History

In August 1979, an investigation by the State of New Hampshire substantiated suspicions that industrial wastes were being disposed of on the Site and the State ordered that no more drums be accepted for disposal at the Site.

In 1981, an EPA contractor, Ecology and Environment, Inc. (E&E), prepared a "Preliminary Site Assessment for the Auburn Road Landfill" which concluded that the Site could contain hazardous wastes and recommended further study to confirm this conclusion. In 1982, E&E performed a hydrogeologic investigation of the Site to further define the presence and extent of groundwater contamination. Based on a Mitre Hazard Ranking System (HRS) score of 36.6 and the Site proposed for listing in the National Priority List (NPL) in December 1982, and was formally included in the NPL in September 1983, ranking 383 out of 416 Sites.

Previous studies of the Site include several hydrogeologic investigations/Site assessments, a neighborhood health survey, a medical epidemiological review of that survey, and numerous analytical testing rounds conducted by public agencies and private consultants.

The most extensive work on-site has been conducted since 1980. A total of 69 monitoring wells (some of which have clusters of wells screened at multiple depths) have been installed and numerous test pits have been excavated at the Site. In 1984, EPA engaged NUS to conduct a RI and a Focused Feasibility Study (FFS). The NUS RI involved additional well installations, test pit excavations, sampling, and geophysical surveys, and was reported in an RI report dated April 10, 1986. In November 1986, EPA issued an Endangerment Assessment (EA) for public review. The EA evaluated Site conditions and estimated the potential present and future risks to human health and the environment posed by the Site.

During the months of May and June 1986, the EPA Environmental Services Division (ESD) commenced a removal action of drummed materials and wastes from the four source areas on-site. During the removal action, EPA ESD conducted test pit excavations in each of the source areas in search of buried drums. As a result, approximately 1,900 drums were removed from the Site, the majority of which were removed from the Town Dump area.

In 1987, all homes identified as potentially being impacted by groundwater contamination from the Site, including the Whispering Pines Mobile Home Park, were connected to the Manchester Water Works public water supply. This action was taken based on a First Operable Unit Record of Decision issued by EPA on September 17, 1986, and was carried out by the Town of Londonderry under an Administrative Order issued on February 24, 1987. Also under EPA's Administrative Order, the Site owner erected a seven-foot high fence was erected around the Town Dump, the Tire Dump and the Solid Waste Area.

During the latter half of 1987, a Supplemental RI was performed for EPA by Roy F. Weston, Inc. (Weston). The objective of this Supplemental RI study was to acquire data that would augment and update previously accumulated data, particularly those data included in the NUS RI Report.

During October 1988, EPA conducted a second drum removal operation at the Tire Dump and Town Dump. At that time, 16 drums were removed from the Town Dump, and approximately 300 drums were removed from the central part of the Tire Dump. The drum removal areas were designated based on the results of additional geophysical testing and test pit excavation performed by Weston as part of the Supplemental RI.

A more detailed description of the Site history can be found in Chapter 1 of the NUS RI Report on Pages 1-2 and 1-7 through 1-16.

On July 10, 1989, EPA entered into a Consent Order with eleven potentially responsible parties (PRPs) which authorized the PRPs to obtain a new round of groundwater sampling from all wells that could be sampled at the Site. The PRPs contracted with Canonie Environmental of Indiana (Canonie), to conduct the groundwater sampling, analyze the samples and prepare a report. Canonie's "Final Report of the Remedial Action Assessment Investigation" was presented to EPA on August 14, 1989, and is included in the Administrative Record for the Site.

B. Enforcement History

From 1984 to the present, EPA has been conducting an ongoing investigation to identify parties who are liable for response costs at the Site. In this regard, EPA has issued approximately 200 information requests, employed private investigators, conducted numerous interviews, and reviewed a multitude of records. At various times throughout the duration of this project, as information became available, parties who EPA determined either owned or operated the Site, generated wastes that were sent to the Site, arranged for disposal of hazardous substances at the Site or transported hazardous substances to the Site, were notified of their potential liability with respect to the Site. To date, 21 parties have been notified.

III. COMMUNITY RELATIONS

Throughout the Site's history, community concern and involvement has been high. EPA has kept the community and other interested parties apprised of the Site activities through informational meetings, fact sheets, press releases and public meetings.

In June 1984, EPA released a community relations plan which outlined a program to address community concerns and keep citizens informed about and involved during remedial activities. On June 28, 1984, EPA held an informational meeting at the Londonderry Junior High School to describe the plans for the RI and FS. Other meetings held for the Site include:

May 21, 1985 - Informational meeting to discuss progress on the RI

April 30, 1986 - Informational meeting to discuss results of the RI

July 30, 1986 - Informational meeting to discuss the FFS

August 6, 1986 - Public meeting to receive comments on the FFS

October 27, 1987 - Informational meeting to discuss the Supplemental RI

September 27, 1988 - Informational meeting to discuss second barrel removal action

March 22, 1989 - Informational meeting to discuss the FS results and EPA's Proposed Plan

March 30, 1989 - Second informational meeting for those people who could not attend the March 22nd meeting

April 25, 1989 - Public Meeting to receive comments on the FS and Proposed Plan

On March 17, 1989, EPA made the Administrative Record available at the Leach Public Library in Londonderry, New Hampshire. The Agency published a notice and brief analysis of the Proposed Plan in the Derry News, Nashua Telegraph and Manchester Union Leader on March 17, 1989.

From March 31, 1989 to May 5, 1989, the Agency held a public comment period to accept comments on the alternatives presented in the FS and the Proposed Plan and on any other documents previously released to the public. This comment period was extended to May 18, 1989, at the request of a number of PRPs. On April 25, 1989, the Agency held a public meeting, which was transcribed, to accept any oral comments. The transcript of this meeting, a summary of the oral and written comments submitted and EPA's responses to those comments are included in the attached responsiveness summary (Appendix A).

IV. SCOPE AND ROLE OF OPERABLE UNIT OR RESPONSE ACTION

The selected remedy was developed by combining a source control alternative and a management of migration alternative, which, together with the First Operable Unit, result in a comprehensive approach for Site remediation. The First Operable Unit, a waterline, was completed in December 1987. The remaining remediation entails two additional operable units. The Second Operable Unit consists of installing overburden and bedrock extraction wells and/or trenches at the Town Dump, Tire Dump and Solid Waste Areas to collect contaminated groundwater from beneath each of these source areas. A series of overburden and bedrock extraction wells will also be installed to capture contaminated groundwater migrating off the Site toward Cohas Brook (Fig. X-1). Collected groundwater will be treated by means of metal precipitation, air stripping and, if necessary carbon adsorption. The need for carbon adsorption as well as the sizing of other various treatment units will be determined based on treatability studies and a pilot plant study to be conducted during remedial design. Treated groundwater will be returned to recharge trenches located within the Site property boundary.

The Third Operable Unit consists of constructing a multi-layered cap over the Town Dump, Tire Dump and Solid Waste Area. The Septage Lagoon Waste Mound will be consolidated with the Solid Waste Area and the two areas capped as one. The caps will be constructed in compliance with Federal and New Hampshire State hazardous waste landfill requirements for closure.

V. SITE CHARACTERISTICS

Chapter 1 of the FS contains an overview of the Supplemental RI. The significant findings of the Supplemental RI are summarized below.

A. Soil

The RI Report and Supplemental RI Report identified four areas of soil contamination at the Site. During the Supplemental RI, 34 soil samples were collected from test pits for analysis of the Hazardous Substance List (HSL) volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides/ PCBs, and inorganic compounds.

1. Town Dump

Analytical findings of soil samples collected in the Town Dump detected the presence of 14 VOCs. Overall, the level of VOC contamination in the Town Dump soil was lower than that reported in the NUS RI. This could be due in part to the drum removal actions which took place in 1986 and 1988. The EPA ESD removed approximately 1,300 drums from the Town Dump in 1986, and an additional 16 drums were removed during the October 1988 removal operation.

There were 5 Semi-Volatile Organic Compounds (SVOCs) found above the method detection limits in the nine test pit soil samples collected in the Town Dump. The five compounds which were detected are dimethyl phthalate, fluoranthene, butylbenzyl phthalate, 4-methylphenol, and bis(2-ethylhexyl) phthalate. No trend of SVOC distribution was evident from the analytical data and contaminant levels were lower than those reported by NUS (10 April 1986).

One pesticide, 4,4-DDD, was detected in one Town Dump soil sample. Two PCBs, Aroclor 1248 and Aroclor 1254, were found in trace concentrations in test pit soil samples. The PCBs were found in soil samples collected from test pits located in the north central area of the Town Dump.

Inorganic constituents were generally detected at levels above background. The maximum concentration of beryllium, nickel and lead were detected at the Town Dump. In this area as well as other source areas, aluminum, calcium, iron, manganese, and magnesium were found at levels exceeding background conditions.

2. Tire Dump

All ten soil samples collected from test pits in the Tire Dump, with the exception of one, showed levels of Total VOC (TVOC) contamination of less than 17 parts per billion (ppb). In the one test pit (TP-30) where the level of TVOC exceeded 17 ppb, buried drums were uncovered. The discovery of these buried drums prompted the second removal action, which took place in October 1988, and resulted in the removal of approximately 300 drums.

There were 16 SVOCs found in Tire Dump soil samples at quantifiable levels above the method detection limits. The SVOCs included fluoranthene, pyrene, acenapthene, fluorene, phenanthrene, benzo(a)anthracene, chrysene, benzo(b)-fluoranthene, benzo(a)pyrene, ideno(1,2,3-cd)pyrene, benzo(g,h,i)perylene, butylbenzyl phthalate, di-n-octyl phthalate, n-nitrosodimethylamine, and 4-methylphenol. The concentration of SVOCs in test pit soil samples varied from not detected (ND) to 131,821 ppb (in TP-31). There were 12 semivolatiles detected at maximum concentrations in the soil sample from TP-31, which is located in the north-central portion of the Tire Dump.

No pesticides were detected in soil samples collected in Tire Dump test pits. PCB Aroclor 1248 was detected in soil samples from three of the ten test pits in the Tire Dump. These test pits are located in the southwest portion of the Tire Dump.

Inorganics that exceeded background levels were detected in only two of the ten soil samples. In these two soil samples (TP-27 and TP-28), inorganic compounds exceeding background levels included zinc and lead. Test pits TP-27 and TP-28 are located in the southwest corner of the Tire Dump. Material excavated in these two test pits included tires, plastic, metal shavings, and metal moldings.

3. Solid Waste Area

VOCs were detected in soil samples from each of the ten test pits dug in the Solid Waste Area. VOCs were found at the highest levels in test pits located in the northern portion of this landfill. In this area, the total VOC concentration in soil samples ranged from 1,704 ppb in TP-12 to 854 ppb in TP-25, with an average concentration of 1,335 ppb for all of the test pit samples. VOCs in these samples were primarily ethylbenzene, 2-butanone, and 2-hexanone. Soil samples from test pits in the southern portion of the landfill (TP-6, TP-7, TP-8, TP-9, TP-10, and TP-11) had VOCs detected at concentrations ranging from 20 ppb in TP-6 to 765 ppb in TP-11, with an average concentration of 227 ppb for all of the test pit samples in this area. The maximum concentration of VOCs in these test pit samples was 2-hexanone, acetone, 2-butanone, xylene, and toluene.

Three SVOCs were measured above detection limits in Solid Waste Landfill test pit soil samples. These compounds were di-n-butyl phthalate, di-n-octyl phthalate, and butylbenzyl phthalate. Di-n-butyl phthalate was detected in all ten test pit soil samples, except one (TP-26). Di-n-octyl phthalate was found above the detection limit in samples collected in three out of ten test pits.

Endosulfan I, a pesticide, was found in one soil sample (TP-25), and PCB Aroclor 1260 was also found in one soil sample (TP-24). Both TP-24 and TP-25 are located at the north end of the landfill.

4. Septage Lagoon

As reported by NUS (10 April 1986), a composite surface soil sample from the Septage Lagoon portion of the Septage Lagoon area was found to have no detectable VOCs. A waste mound is located adjacent to the Septage Lagoon containing approximately 5,000 cubic yards of household debris, demolition debris, tires, plastic, cloth, and sand. This waste mound is considered a component of the Solid Waste Landfill (which is located less than 100 feet west of the mound) in all discussions in this ROD.

VOCs found in Septage Lagoon Test Pit (TP) soil samples were at low levels (less than 100 ug/kg) and included xylenes (TP-3), styrene (TP-4), and toluene (TP-4). TP-3 and TP-4 are located on the waste mound. No VOCs were detected in soil samples from TP-1, TP-2, located in the former septage lagoon, and TP-5, located in the waste mound.

Five SVOCs were detected in test pit soil samples. The semivolatile compounds include di-n-butyl phthalate, butylbenzyl phthalate, di-n-octyl phthalate, diethyl phthalate, and phenanthrene. Di-n-butyl phthalate was found in soil samples from six test pits, at concentrations ranging from 1,500 ug/kg to 4,200 ug/kg. The presence of the other semivolatiles was sporadic. Butylbenzyl phthalate was detected in only one test pit, TP-2, at a concentration of 2,200 ug/kg. Di-n-octyl phthalate was found in 2 test pits at concentrations ranging from 73 to 1,100 ug/kg. Diethyl phthalate was found at concentrations of 420 and 110 ug/kg. Soil sample TP-3 contained 37 ug/kg of phenanthrene. Lindane was detected at a concentration of 290 ug/kg in the soil sample from TP-4.

With the exception of arsenic, no suspected carcinogenic inorganic compounds were detected in Septage Lagoon soil samples. Arsenic was found in each test pit, at concentrations ranging from 1 to 2.6 mg/kg. Calcium, lead, thallium, and vanadium were also found above background levels in at least two soil samples.

B. Groundwater

As part of the Supplemental RI, groundwater samples were collected from 47 wells, located throughout the Site as well as in off-site locations near the Whispering Pines Ponds and Cohas Brook, in August 1987. All wells were sampled and analyzed for the Hazardous Substance List (HSL) VOCs. Selected wells were sampled for HSL semivolatiles, pesticides/PCBs, and inorganic compounds. Also, in response to comments provided by the public and Potentially Responsible Parties (PRPs) on the Proposed Plan, EPA authorized the PRPs to obtain a new round of groundwater sampling from all wells that could be sampled at the Site. This new round of sampling was conducted under a Consent Order, issued on July 10, 1989. Results of this latest sampling round, as well as other data collected under the Consent Order, are presented in a report prepared by Canonie Environmental (Canonie) and entitled "Final Report Of The Remedial Action Assessment Investigation Auburn Road Landfill Superfund Site," (RAAI), dated August 1989. These data represent the most current characterization of groundwater quality at the Site.

Currently, the overall contaminant concentration at the Site appears to be lower than that reported by NUS in April 1986, and in the Supplemental RI. VOC contaminants presently exceeding U.S. EPA Maximum Contaminant Levels (MCLs) include trichloroethene, tetrachloroethylene, 2-Butanone, 1,2-Dichloropropane, 1,2-Dichloroethylene, 1,1,1-Trichloroethane, and vinyl chloride. There were 14 SVOCs detected in groundwater samples obtained during the 1987 sampling round, including 4-nitroaniline, which is a suspected carcinogen. The semivolatile compound found at the highest concentration (by an order of magnitude) was benzoic acid. No trends of semivolatile compound distribution are evident from the database. No pesticides were detected in groundwater samples. There were 21 inorganic compounds detected in groundwater at the Site during the 1987 sampling round. Of the three suspected carcinogenic inorganic compounds detected (arsenic, beryllium, and nickel), only arsenic was found at levels exceeding the U.S. EPA MCL in both the 1987 and 1989 sampling round. Information regarding background water quality can be found in the NUS report (10 April 1986).

Two primary plumes are evident at the Site (Figure 4-2, Supplemental RI Report). These plumes are based on VOC distribution. A central plume originates in the Solid Waste Landfill and trends northward, toward the NUS-1 well cluster. A western plume likely originates in the Town Dump and also trends northward. These two plumes merge in the vicinity of the NUS-2 well cluster. Secondarily, an arsenic central plume mimics the areal geometry of the VOCs central plume. VOC concentrations have become lower in the vicinity of the Solid Waste Landfill and become higher downgradient, at the NUS-1 well cluster, suggesting that the plume has migrated to the north. Based on EPA's interpretation of data presented in the Canonie RAAI, the Central Plume, as described in the Supplemental RI, is still identifiable, although recent measurements of contaminant concentrations appear to have decreased somewhat at the southern end of the plume. This plume, as demonstrated by the RAAI data and data from previous studies, occurs primarily in deep overburden/weathered bedrock and not primarily in bedrock as described by Canonie.

A complete description of the Site characteristics can be found in Chapter 4 of the Supplemental RI Report.

C. Surface Water

The NUS RI included a surface water investigation to determine the presence or absence of contamination in the unnamed brooks on-site as well as the Whispering Pines Pond and Cohas Brook. Surface water and sediment samples were collected and analyzed. Results of the analysis indicate that the surface waters and sediments on and adjacent to the Site are contaminated with low levels (less than 20 ppb) of VOCs. The EA characterized the risks associated with exposure to these contaminants at the levels detected to be insignificant.

D. Air

Ambient air monitoring was performed on three separate occasions during the RI performed by NUS. Results of the air monitoring showed that very low levels (less than 16 ppb) of VOCs were detected on or near the Site. As characterized in the EA, the levels of air contamination detected pose no threat to either children or adults from inhalation of contaminants directly or through inhalation of dust from the Site.

VI. Summary of Site Risks

In November 1986, EPA issued the EA for this Site. The EA was performed to determine the present and future potential risks to public health and the environment posed by the Site, based on existing conditions. Seventeen contaminants of concern were selected for evaluation in the EA. These contaminants constitute a representative subset of the more than 80 contaminants identified at the Site during the RI. The seventeen contaminants were selected to represent potential on-site hazards based on toxicity, level of contamination, frequency of detection, and mobility and persistence in the environment. Potential human health effects associated with the contaminants of concern in soils and groundwater were estimated quantitatively through the development of several hypothetical exposure scenarios. Incremental lifetime cancer risks and a measure of the potential for noncarcinogenic adverse health effects were estimated for the various exposure scenarios.

Exposure scenarios were developed to reflect the potential for exposure to hazardous substances based on the characteristic uses and location of the Site.

The EA concluded that risks from exposure to contaminants from the Auburn Road Site were, for the most part, low to minimal. Exceptions to this conclusion included direct contact and subsequent ingestion of subsurface soils in the Town Dump, Tire Dump and Solid Waste Area and ingestion of contaminated groundwater. Since completion of the EA, two removal actions were completed, resulting in the removal of approximately 2200 barrels of waste from the Site. In addition, a fence has been installed around each source area to prevent public access and a waterline has been installed along Auburn Road to replace the water supplies for the Whispering Pines Mobile Home Park and the residences along Auburn Road. In order to assess current conditions at the Site, the results of soil and groundwater sampling conducted during the Supplemental RI were evaluated and new risk calculations performed in the FS (Appendix B). Based on this data, the risks associated with direct contact and subsequent ingestion of contaminated subsurface soils is no longer a threat. However, ingestion of contaminated groundwater still represents a major risk. This is not a current risk as potentially affected residences have been supplied with an alternative drinking water source. The remedial response selected here is based upon the revised risk calculations presented in Appendix B of the FS.

A complete discussion of the Site risks can be found in Chapter 9 of the EA and Appendix B of the FS.

VII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

EPA adopted a proposed plan for remediation of the Site on March 17, 1989. The management of migration portion of the preferred alternative included installation of groundwater extraction wells and trenches on and off-site; a groundwater treatment facility consisting of metal precipitation, air-stripping and carbon adsorption, if necessary; recirculation of a portion of the treated groundwater and applying it back on to areas in the Tire Dump and Solid Waste Area to promote flushing of residual soil contamination; and discharge of the major portion of the treated groundwater to recharge trenches located on-site. The source control portion of the preferred alternative included consolidation of the Septage Lagoon Waste Mound with the Solid Waste Area; shredding all on-site tires and placing them on the Tire Dump; and placing a multi-layered cap over the Town Dump, Tire Dump and Solid Waste Area once groundwater cleanup goals are attained.

The remedy proposed in this Record of Decision is essentially the same as the remedy presented in EPA's Proposed Plan. However, based on comments received during the comment period, and new data presented in the RAAI, some minor changes to the Proposed Plan have been made.

The proposed remedy provided for returning a portion of the treated groundwater to the Solid Waste Landfill and to the section of the Tire Dump where the 1988 drum removal was performed. The intent was to try to flush contaminants from the soils to the groundwater where it would be collected and treated. This would have constituted nothing more than accelerating the natural flushing which presently occurs. However, in consideration of comments received during the comment period, and upon further review of flushing techniques as applied to the

Site, EPA has concluded that the effectiveness of flushing contaminants at the Solid Waste Landfill is questionable, due to the types of materials located in the area, the proximity of the debris to bedrock and the difficulty in controlling leachate. Accordingly, flushing of contaminants at the Solid Waste Landfill has been eliminated from the selected remedy. Flushing is still considered a viable option at the Tire Dump, where none of the above concerns apply. However, based on the most recent groundwater sampling conducted during the RAAI, groundwater contamination emanating from the Tire Dump no longer appears to warrant flushing of contaminants from the soils to aid in groundwater cleanup. Therefore, flushing of soils at the Tire Dump has also been eliminated. Consequently, since capping of the Site was to be postponed until completion of soil flushing, and flushing of soils is no longer recommended, capping of the waste areas can now be performed concurrently with groundwater remediation.

Also, based on EPA's interpretation of the RAAI groundwater results, a revised collection and treatment scheme was developed and is presented in the Technical Oversight of PRPs Remedial Action Assessment Investigation prepared by Weston and dated September 1989 (Weston Response to RAAI). The number of extraction wells and length of extraction trenches has been reduced. Additionally, due to the fact that the highest levels of contamination were found in either the deep overburden or weathered bedrock, the overburden recovery wells have now been assumed to be screened only in the bottom 10 feet of the overburden and the bedrock recovery wells only in the top 15 feet of the bedrock. This is in contrast to the deeper screenings conceptually proposed in the FS. Finally, the groundwater extraction rate has now been assumed to be 190 gallons per minute (gpm) as opposed to the 275 gpm presented in the FS and Proposed Plan.

Calculated costs, using the revised collection and treatment system, are presented in the Weston Response to the RAAI. For costing purposes, it has now been assumed that the wells near Whispering Pines Pond will be pumped for a minimum of three years and that total pumping time for all recovery wells will require no more than ten years. Under these assumptions the total cost, including capping, would range from $17.3 million to $20.6 million. This cost is lower than EPA's previous estimates of $23.1 million as presented in the FS and Proposed Plan, but is within the limits of the sensitivity analysis presented in the FS. Since the actual number of and depth of extraction wells and trenches will not be finally determined until Remedial Design, costs carried through this ROD will be as presented in the FS with the acknowledgement that these costs are conservative.

Finally, the compliance boundary, as shown in Figure 4-18 of the FS, is now extended south along the unnamed brook and additional extraction wells between the Solid Waste Area and the unnamed brook are proposed. This is to insure that contaminated groundwater from the Solid Waste Area, the Eastern Plume depicted in the RAAI, meets EPA's cleanup goals prior to reaching the unnamed brook.

VIII. DEVELOPMENT AND SCREENING OF ALTERNATIVES

A. Statutory Requirements/Response Objectives

Prior to the passage of the Superfund Amendments and Reauthorization Act of 1986 (SARA), actions taken in response to releases of hazardous substances were conducted in accordance with CERCLA as enacted in 1980, and the revised National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300 (1988), promulgated in the Federal Register on November 20, 1985. Although EPA proposed revisions on December 21, 1988, to the NCP to reflect SARA, until those proposed revisions are finalized, the procedures and standards for responding to releases of hazardous substances, pollutants and contaminants shall be in accordance with Section 121 of CERCLA and to the maximum extent practicable, the current NCP.

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that EPA's remedial action, when complete, must comply with applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is granted; a requirement that EPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a statutory preference for remedies that permanently and significantly reduce the volume, toxicity or mobility of hazardous wastes over remedies that do not achieve such results through treatment. Response alternatives were developed to be consistent with these Congressional mandates.

A number of potential exposure pathways were analyzed for risk and threats to public health and the environment in the EA and the FS. Guidelines in the Superfund Public Health Evaluation Manual (EPA, 1986) regarding development of risk analyses for remedial alternatives were used to assist EPA in the development of response actions. As a result of these assessments, remedial response objectives were developed to mitigate existing and future threats to public health and the environment. These response objectives are:

Groundwater

To reduce potential present and future public health risks from ingestion of contaminated groundwater.

To reduce potential present and future environmental risks to aquatic and terrestial wildlife from exposure to the groundwater which has migrated to the surface waters.

Soil

To reduce potential present and future public health risks from ingestion of contaminated soil.

B. Technology and Alternative Development and Screening

CERCLA, the NCP, and EPA guidance documents, including "Guidance on Feasibility Studies Under CERCLA" dated June 1985, the "Interim Guidance on Superfund Selection of Remedy" [EPA Office of Solid Waste and Emergency Response (OSWER)], Directive No. 9355.0-19 (December 24, 1986) and the Interim Final "Guidance for Conducting RIs and FSs under CERCLA," OSWER Directive No. 9355.3-01, set forth the process by which remedial actions are evaluated and selected. In accordance with these requirements and guidance documents, a range of treatment alternatives, including a containment option involving little or no treatment and a no action alternative were developed for the Site.

Section 121(b)(1) of CERCLA presents several factors that at a minimum EPA is required to consider in its assessment of alternatives. In addition to these factors and the other statutory directives of Section 121 of CERCLA, the evaluation and selection process was guided by the EPA document "Additional Interim Guidance for FY '87 Records of Decision" dated July 24, 1987. This document provides direction on the consideration of SARA cleanup standards and sets forth nine factors that EPA should consider in its evaluation and selection of remedial actions. The nine factors are:

1. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs).
2. Long-term Effectiveness and Permanence.
3. Reduction of Toxicity, Mobility or Volume.
4. Short-term Effectiveness.
5. Implementability.
6. Community Acceptance.
7. State Acceptance.
8. Cost.
9. Overall Protection of Human Health and the Environment.

Chapter 3, Section 3.1 of the FS identified, assessed and screened technologies based on waste-limiting (waste characteristics that limit the effectiveness or feasibility of a technology) and site-limiting (site characteristics, such as a high water table, that preclude the use of a technology) factors unique to the Site, and the level of technical development for each technology. These technologies were combined into source control (SC) and management of migration (MM) alternatives. Chapter 3, Section 3.2 of the FS presented the remedial alternatives, developed by combining the technologies identified in the previous screening process, in the categories required by OSWER Directive No. 9355.0-19. The purpose of the initial screening was to narrow the number of potential remedial alternatives for further detailed analysis while preserving a range of options. Each alternative was then evaluated and screened in Chapter 4 of the FS. In summary, of the 24 source control and management of migration remedial alternatives screened in Chapter 3, 10 were retained for detailed analysis. Table VIII-1 identifies the 10 alternatives that were retained through the screening process. Table 3-5 and 3-8 in the FS identify the 24 alternatives that were retained through the screening process, as well as those that were eliminated from further consideration.

Table VIII-1

Source Control and Management of Migration Alternatives
Auburn Road Landfill

SC-1	No Action
SC-2	In situ closure of all source areas.
SC-3	In situ closure of Solid Waste Landfill. Excavation of Tire Dump and Town Dump source areas. On-site incineration of selected Tire Dump and Town Dump soil and wastes. On-site landfill of ash and non-treated soil and wastes.
SC-4	Excavation of all source areas. Low Temperature Thermal Stripping (LTTS) of Town Dump soil and soil requiring treatment from other source areas. On-site landfill of non-treated soil and wastes, and treated soil. Off-site treatment of nonvolatile soil and wastes requiring treatment.
SC-5	Excavation of all source areas. On-site incineration of selected soil and wastes. On-site landfill of ash and non-treated soil and wastes.
SC-6	Excavation of all source areas. Off-site treatment and/or disposal of all excavated soils and wastes.
SC-7	Excavation of all source areas. Composting/aeration treatment of excavated soil. On-site landfill of excavated wastes and treated soil.
MM-1	No Action
MM-2	Groundwater recovery, on-site treatment and discharge to on-site recharge trenches.
MM-3	Groundwater recovery, on-site pretreatment and discharge to off-site POTW.

IX. DESCRIPTION/SUMMARY OF THE DETAILED AND COMPARATIVE ANALYSIS OF ALTERNATIVES

This section presents a narrative summary and brief evaluation of each alternative according to the evaluation criteria described above. A tabular assessment of each alternative can be found in Tables 4-1 through 4-10 of the FS.

A. Source Control (SC) Alternatives Analyzed

The source control alternatives analyzed for the Site include a minimal no action alternative (SC-1); one containment by capping alternative (SC-2); four alternatives combining treatment by either thermal destruction or composting followed by containment by landfilling (SC-3, 4, 5 and 7); and one off-site treatment and disposal alternative (SC-6).

SC-1: No Action

The No Action alternative for the Auburn Road Site is limited to fencing and long-term monitoring. No treatment of the source waste is involved. Therefore, the environmental fate and removal of contaminants found at the Site would be dependent on the dynamics of natural transport mechanisms. The degradation mechanisms that are relevant to the Auburn Road Site are volatilization and leaching.

The three source areas have already been fenced with seven-foot high fence. The fenced areas would be off-limits to all people other than those authorized to take samples for monitoring purposes. The fences would be repaired to prevent unauthorized access. Keys to the gate to the overall Site would be available to the Site owners and regulatory authorities.

Barren source areas would be seeded to control dust and decrease infiltration of contaminants to groundwater. This control would be effected once the seeds sprouted and the ensuing vegetative growth covered these barren areas. These areas include part of the Tire Dump and most of the Town Dump.

Institutional controls would be implemented to limit future Site use. The entire Site would be designated as a solid waste facility thereby preventing future Site development.

In addition, a multimedia monitoring program (including air, surface water, and groundwater sampling) would be conducted at the Site to evaluate potential exposure routes from the Site to specific receptors.

Although easily implementable, the No Action Alternative will not comply with ARARs. By allowing residual soil contamination, particularly VOCs and SVOCs, to continue to leach slowly from the soils to the groundwater beneath each source area, Federal and State groundwater and drinking water standards would not be met. In addition, EPA's Ground Water Protection Strategy, which is a factor to be considered, and the New Hampshire Ground Water Protection Regulations would not be met. Except for preventing direct contact with contaminated soils, this alternative would provide no protection of human health and the environment.

A detailed assessment of this alternative can be found on Pages 4-48 through 4-55 of the FS.

Estimated Time For Design & Construction	15 to 18 months
Estimated Time For Operation	30 years
Estimated Capital Cost	$240,000
Estimated O & M Cost(Present Worth)	$2,150,000
Estimated Total Cost(Present Worth)	$2,390,000

SC-2:In Situ Closure of all Source Areas

Under this alternative, a cap would be placed over each disposal area, with only minimal disturbance of source material and no excavation. For closure of the Auburn Road site, a multilayered cap system would be installed that would, at a minimum, consist of a vegetative topsoil layer, a subsurface drainage layer, and a low permeability layer (barrier) that would underlie the drainage layer. SC-2 was ulimately adopted as the source control component of the remedy and is described in more detail in Section X of this document.

Estimated Time For Design & Construction	1 year
Estimated Time For Operation	30 years
Estimated Capital Cost	$5,100,000
Estimated O & M Cost(Present Worth)	$2,400,000
Estimated Total Cost(Present Worth)	$7,500,000

SC-3: On-Site Incineration/Capping Solid Waste Area/On-Site Landfill

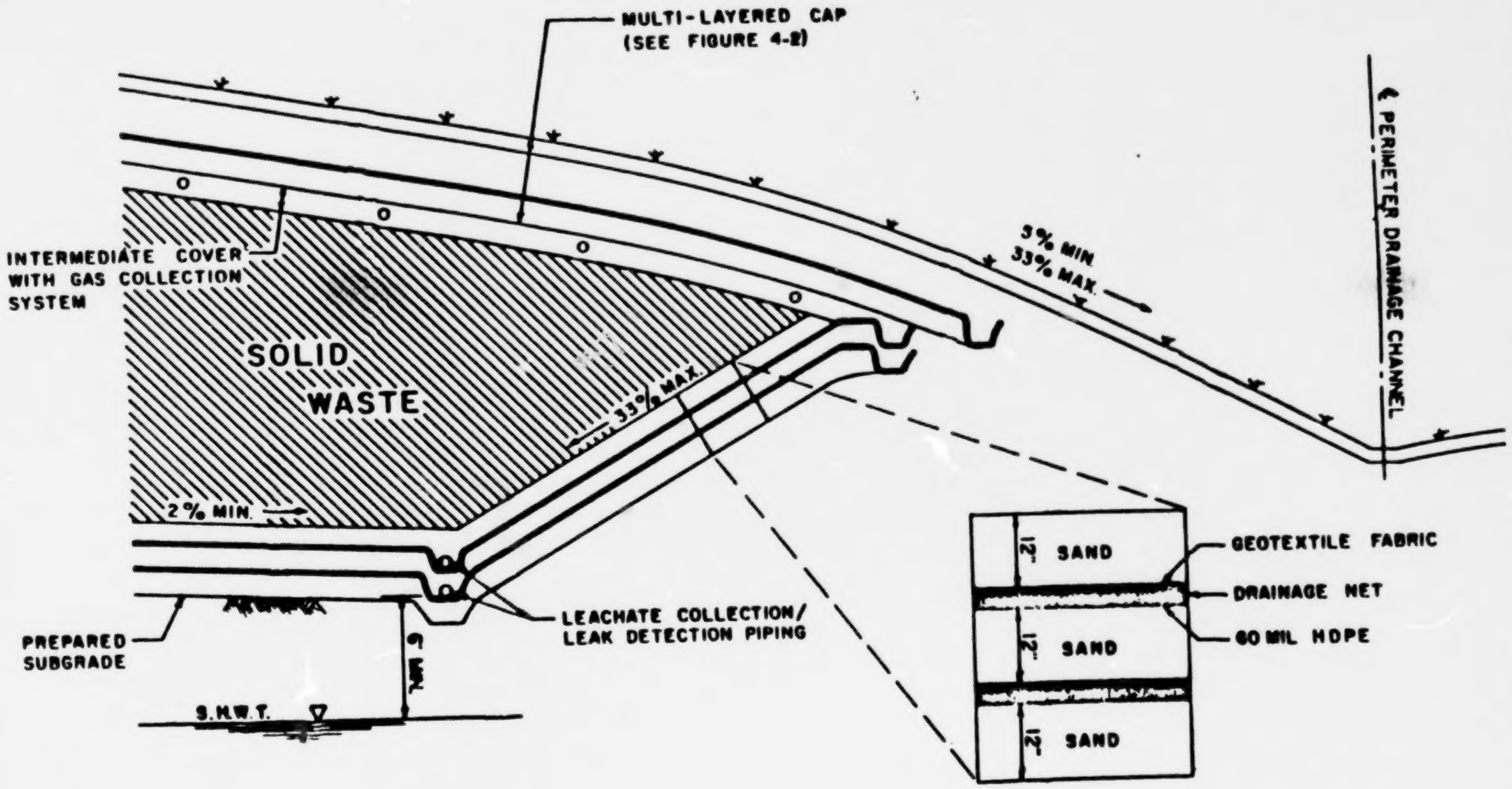
Like SC-2, this alternative entails in situ closure (capping) of the Solid Waste Landfill. As distinct from SC-2, this alternative includes excavation of both the Town Dump and Tire Dump, and then either on-site incineration or on-site landfilling of the excavated soils and wastes. The determination of whether the excavated material would be incinerated or placed directly in an on-site landfill would be made on the basis of whether the waste is subject to RCRA Land Disposal Restrictions (40 CFR 268). Wastes or soils which contain leachable organics or inorganics would require treatment prior to placement in a landfill. The procedures required to implement this alternative would include excavation, transportation, hauling, incineration, landfill construction, and site restoration.

For purposes of this alternative, the Solid Waste Landfill would be capped due to the type of waste (primarily household) observed in the test pits, the low levels of indicator chemicals detected in soils, and the need to comply with Federal and New Hampshire requirements for closure of a hazardous waste unit. Approximately 220,000 square feet of capping would be required. See Subsection 4.2.2 of the FS for a description of the capping process.

Approximately 125,000 cubic yards of material containing solid wastes, tires, and soil would be excavated. Test-pit data show that some of this material may be contaminated with VOCs, SVOCs, and pesticides and PCBs (at low concentrations). Of this total excavated volume, some solid wastes may have to be incinerated with the hazardous substances, depending on the level of contamination of that solid waste.

Excavation, sampling and analysis, incineration, and landfilling would proceed at a rate determined primarily by incinerator capacity. A large mobile incinerator (300 cubic yards/day capacity) would need 2 years to treat the anticipated volume of wastes (56,000 cubic yards) which may require incineration. Excavation would cease when the level of soil contamination remaining was below the level that would produce groundwater concentrations that exceed the groundwater target cleanup levels (Ref. Table 2-6 of the FS). This would be determined by sampling of unexcavated soils.

An on-site landfill capable of handling approximately 110,000 cubic yards of material would be required to dispose of solidified incinerator ash and material not needing treatment. The on-site landfill would be constructed in accordance with the current Federal and state laws and regulations. At a minimum, the landfill would include a double-liner system with a leachate collection, storage, and treatment system; a leak-detection system; a multilayered final cover (cap); surface drainage controls; and a network of groundwater monitoring wells. A typical landfill cross-section is shown in Figure IX-1.


MULTI-LAYERED CAP
(SEE FIGURE 4-2)
℄ PERIMETER DRAINAGE CHANNEL
3% MIN.
33% MAX.
INTERMEDIATE COVER
WITH GAS COLLECTION
SYSTEM
SOLID
WASTE
33% MAX.
2% MIN.
PREPARED
SUBGRADE
LEACHATE COLLECTION/
LEAK DETECTION PIPING
6' MIN.
S.H.W.T.
12" SAND
12" SAND
12" SAND
GEOTEXTILE FABRIC
DRAINAGE NET
60 MIL HDPE

TYPICAL SECTION

NOT TO SCALE

RCRA LANDFILL
(ALTERNATIVES SC-3, SC-4, SC-5)
DOUBLE-LINER SYSTEM

Figure IX-1

This alternative could easily be implemented as equipment needed is readily available. This alternative would result in a reduction of toxicity and volume of the wastes on-site. It would also provide a high degree of protection for human health and the environment as well as attain all ARARs. However, the cost of this alternative is approximately five times greater than alternative SC-2.

A detailed assessment of this alternative can be found on Pages 4-67 through 4-82 of the FS.

Estimated Time For Design & Construction	2 years
Estimated Time For Treatment Operation	2 years
Estimated Capital Cost	$38,000,000
Estimated O & M Cost(Present Worth)	$3,200,000
Estimated Total Cost(Present Worth)	$41,200,000

SC-4: Excavation of all source areas; On-Site Low-Temperature Thermal Stripping(LTTS)/On-Site Landfill

In this alternative, all source areas would be excavated, selected soils would be treated on-site, soils and wastes would be landfilled on-site, and if necessary, soils and certain small volumes of wastes would be treated and disposed of off-site. The on-site treatment for soils would be the Low-Temperature Thermal Stripping (LTTS) process.

Approximately 240,000 cubic yards of materials would be excavated from the source areas. An estimated 40,000 cubic yards of contaminated soils would be treated in the LTTS unit. The same criteria as discussed for Alternative SC-3 would be used to determine which soils and wastes would need treatment. All treated and untreated soils and wastes would be placed in an on-site landfill built to Federal and State standards (See Figure IX-1). Clean soil would be transported to the Site to backfill the excavated areas.

During the preliminary design phase, contaminated soils from the Auburn Road Site would be used in a pilot plant test to determine the operating conditions and the efficiency of the LTTS process. The primary contaminants found in the soils at the Site have been removed effectively with this process at other sites.

At full-scale operation, the LTTS system would process approximately 60 cubic yards of soil during a 10-hour day. The processing rate would be partly determined by the soil moisture content. The operation would be completed within 4 years after startup, if the facility operated on a single 10-hour shift and had a staff of 7 to 10 full-time personnel.

Implementability of this alternative is good as the type of equipment necessary is readily available. Implementation of this alternative would also result in a reduction of toxicity but not necessarily volume as contrasted with SC-3. This alternative is in compliance with all ARARs and would also provide a high level of protection of human health and the environment. The cost of this alternative is approximately $9 million less than alternative SC-3 but 4 times greater than SC-2.

A detailed assessment of this alternative can be found on Pages 4-82 through 4-94 of the FS.

Estimated Time For Design & Construction	2 years
Estimated Time For Treatment Operation	4 years
Estimated Capital Cost	$31,300,000
Estimated O & M Cost(Present Worth)	$1,400,000
Estimated Total Cost(Present Worth)	$32,700,000

SC-5: Excavation of all source areas; On-Site Incineration and On-Site Landfill

As with Alternative SC-4, in this alternative, all source areas would be excavated. The excavated material would then be sampled and analyzed. Based on that analysis, these materials would be either incinerated or landfilled on-site. Incineration would destroy the organic compounds in the contaminated soils and wastes. Approximately 240,000 cubic yards of materials (containing solid wastes, tires, and soil) would be excavated. Data from test pit samples indicate that some of the soil and waste may be contaminated with VOCs and SVOCs which may require treatment to meet current land disposal requirements. Of the approximately 80,000 cubic yards that may require on-site incineration, 50,000 cubic yards of ash would be generated, which would be landfilled in accordance with Federal and state regulations. The incinerator ash and remaining volume of excavated materials (approximately 160,000 cubic yards total) would be placed in an on-site landfill as described for Alternative SC-4.

Excavation, sampling and analysis, incineration, and landfilling would proceed at a pace limited primarily by incinerator capacity throughput. A large mobile incinerator (300 cubic yards/day capacity) would require 2 years to treat 80,000 cubic yards of contaminated materials.

This alternative is equivalent to alternatives SC-3 and SC-4 in terms of implementation and compliance with ARARs. However, this alternative would provide a greater reduction in toxicity and volume than either SC-3 or SC-4. This alternative would also provide a high degree of protection of public health and the environment. The total cost of this alternative is approximately $21 million more than SC-4, $12 million more than SC-3 and $46 million more than SC-2.

A detailed assessment of this alternative can be found on Pages 4-94 through 4-99 of the FS.

Estimated Time For Design & Construction	2 years
Estimated Time For Treatment Operation	2 years
Estimated Capital Cost	$52,200,000
Estimated O & M Cost(Present Worth)	$1,400,000
Estimated Total Cost(Present Worth)	$53,600,000

SC-6: Excavation all source areas; Off-Site Treatment and Off-Site Disposal

In this alternative, contaminated soil and other wastes would be excavated, dewatered, sampled and analyzed, containerized, and transported off-site, without pretreatment, to a Treatment, Storage, and Disposal facility (TSD) in compliance with Federal and State laws and regulations. Any soils not requiring off-site treatment (i.e., not subject to land disposal restrictions) would be transported directly to a RCRA landfill for disposal. Final site restoration would include grading and backfilling with on-site materials.

Backhoes and earth-moving equipment would be required, as would trucks, laboratory and administration trailers and equipment, and health and safety equipment.

Waste and soil characteristics would be determined to ensure appropriate methods of handling, transportation, and disposal. Excavated materials would be transported in compliance with applicable Federal and State regulations. All vehicles would be carefully loaded, secured, and decontaminated to prevent contamination of public areas.

An appropriate accessible TSD facility in compliance with Federal and State laws and regulations would need to be identified with sufficient capacity to accept the large waste quantity. The facility must also be able to accept solid wastes, tires, and other debris, and soils containing metals and organic compounds. This alternative would treat or properly manage soil and wastes (240,000 cubic yards) contaminated with VOCs, extractable organics, and inorganics from all three source areas. Experience with this technology shows that approximately 800 cubic yards/day could be excavated, field-analyzed, and transported to a TSD facility. At this rate, excavation and backfilling would require approximately 2 years.

Since all wastes would be removed from the Site, this alternative would meet all ARARs and would provide the highest long term effectiveness of all alternatives evaluated. It would also provide for the greatest reduction of toxicity, mobility and volume at the Site. However, locating a disposal facility which could accept the large volume of waste from the Site could be very difficult, making this alternative difficult to implement. While this alternative would provide the greatest long term protection of public health and the environment, short term protection of public health and the environment would be low due to increased truck traffic along Auburn Road and the potential for an accident involving a truck hauling hazardous materials. The total cost of this alternative also greatly exceeds that of any of the other alternatives evaluated.

A detailed assessment of this alternative can be found on Pages 4-100 through 4-107 of the FS.

Estimated Time For Design & Construction	2 years
Estimated Time For Operation	2 years
Estimated Capital Cost	$190,100,000
Estimated O & M Cost(Present Worth)	$0
Estimated Total Cost(Present Worth)	$190,100,000

SC-7: Excavation of all source areas; Aerobic Soil Composting and On-Site Landfill

In this alternative, source areas would be excavated, a selected quantity of soil and waste would be treated and landfilled on-site, and a lesser quantity of soil and waste would be treated and disposed of off-site. On-site treatment would be aerobic composting. On-site disposal would be in a landfill as described for alternative SC-3. Off-site treatment and disposal would be at a treatment, storage, and disposal (TSD) facility in compliance with Federal and State laws and regulations.

Approximately 240,000 cubic yards of solid wastes and soils would be excavated. Based on the results of previous test pit excavations, it is estimated that approximately 50 percent of this material would be solid wastes and the remainder soil. Approximately 40,000 cubic yards of contaminated soil may require treatment prior to disposal in an on-site landfill.

Excavation and staging, sampling and chemical analysis, separation of soil from solid wastes, and construction of an on-site landfill would be performed as described for Alternative SC-4. The primary difference between this alternative and Alternative SC-4 is the method of treating contaminated soil.

Aerobic composting would be performed in a 400-foot by 100-foot building to control potential atmospheric VOC emissions and to permit year-round operation. Due to the volume of contaminated soil to be treated (40,000 cubic yards) and the time required to adequately treat the soil, the soil treatment (at a rate of approximately 28 cubic yards per day) would require approximately 5 years. A commercially-available sludge composting process would be adapted to treat the contaminated soils. An aerobic process was selected because it would provide more rapid biodegradation, better generation and control of biological activity and heat, and additional VOC removal during the aeration and mixing processes.

The Auburn Road facility would consist of 10 composting bays. Contaminated soil would be deposited daily into the mixing area. It would be combined with a bulking agent at a volume ratio of 2 to 1. The bulking agent would provide increased porosity and nutrients to the soil. Suitable bulking agents would be horse and/or cow manure; inorganic nutrients and straw or grains could also be used.

As with alternative SC-3, SC-4 and SC-5, this alternative is relatively easy to implement and would be designed and operated to meet all ARARs. This alternative would provide some reduction in toxicity although to a lesser degree compared with other alternatives. Because of the need to add other materials such as manures, straw or wood chips to improve the composting efficiency, the total volume of material for landfill disposal would be greater than with other alternatives. Implementation of this alternative would be as protective of public health and the environment as alternatives SC-3, SC-4 and SC-5. The total cost of this alternative is estimated to be less than the cost for alternative SC-3, SC-5 and SC-6, but approximately four times greater than SC-2.

A detailed assessment of this alternative can be found on Pages 4-107 through 4-119 of the FS.

Estimated Time For Design & Construction	2 years
Estimated Time For Treatment Operation	5 years
Estimated Capital Cost	$28,400,000
Estimated O & M Cost(Present Worth)	$1,400,000
Estimated Total Cost(Present Worth)	$29,800,000

B. Management of Migration (MM) Alternatives Analyzed

Management of migration alternatives address contaminants that have migrated from the original source of contamination. At the Site, contaminants have combined with groundwater and migrated from the Town Dump, Tire Dump and Solid Waste Areas generally in a northerly direction. The contaminated groundwater has moved beyond the Site's northerly property boundary, under Whispering Pines Pond and toward Cohas Brook. The management of migration alternatives evaluated for the Site include a minimal no action with monitoring alternative (MM-1), an alternative consisting of groundwater extraction, treatment and on-site discharge (MM-2), and an alternative consisting of groundwater extraction, treatment and discharge to a Publicly Owned Wastewater Treatment Works (MM-3).

MM-1: No Action

In this alternative, groundwater and surface water would be monitored. To date, contaminant concentrations that exceed ARARs have not been detected in surface water downgradient of the Site. However, if levels of contaminants exceeding ARARs were detected in Cohas Brook or Whispering Pines Pond, these exposure routes and associated risks and potential impacts on aquatic life would be assessed and remedial actions considered.

Since contaminants would continue to migrate from the Site to potential human and environmental receptors, three types of water quality monitoring would occur; i.e., groundwater monitoring, surface-water monitoring, and residential well monitoring.

- Groundwater Monitoring -- On-site wells would be monitored in accordance with the selected source control alternative. Off-site wells would be used to monitor off-site contaminant migration. Additional on-site and off-site monitoring wells would be installed if determined necessary for an effective monitoring program.

- Surface-Water Monitoring -- Both Cohas Brook and the brook flowing into Whispering Pines Pond would be monitored. Cohas Brook would be monitored downstream of the confluence of the brook and the outfall from Whispering Pines Pond. The brook flowing into Whispering Pines Pond would be monitored just upstream of the pond.

- Residential Well Monitoring -- Approximately 15 residential wells northwest and northeast of the Site would be included in the residential well monitoring program. Homes located on Shady Lane, Longwood Avenue, and the Route 28 by-pass would be included. The scope of the residential well monitoring program would be expanded if any of the well data indicated potential impacts from the Site.

The groundwater, surface water, and residential wells would be sampled every 6 months for all pollutants on the EPA HSL. This monitoring would continue until the source no longer presented a threat to human health and the environment. For the purposes of cost development, monitoring for 30 years has been assumed.

Institutional restrictions (through zoning or similar local land use ordinances) on groundwater withdrawal and usage would be required for properties located between Whispering Pines Pond and Cohas Brook. Additional restrictions might be required in the future based on monitoring results.

Because this alternative involves only monitoring, it could be readily implemented. However, this alternative provides no reduction in toxicity, mobility or volume and does not meet ARARs, specifically, Federal and State groundwater and drinking water standards. Nor does this alternative comply with EPA's Ground Water Protection Strategy, which is a factor to be considered, or the New Hampshire Ground Water Protection Regulations. In addition, since groundwater contamination levels would continue to exceed acceptable drinking water standards off-site, this alternative would not provide protection of public health or the environment.

A detailed assessment of this alternative can be found on Pages 4-120 through 4-125 of the FS.

Estimated Time For Design & Construction	15 - 18 months
Estimated Time For Operation (Monitoring)	30 years
Estimated Capital Cost	$14,000
Estimated O & M Cost(Present Worth)	$2,000,000
Estimated Total Cost(Present Worth)	$2,014,000

MM-2:Groundwater Extraction; On-Site Treatment and On-Site Discharge

In this alternative, groundwater would be extracted and treated by using a combination of overburden and bedrock wells and overburden collection trenches, and a groundwater treatment system. Following treatment, the groundwater would be discharged on-site outside the source control areas. MM-2 was ultimately adopted as the management of migration component of the selected remedy and is described in more detail in Section X of this document.

Estimated Time For Design & Construction	3 years
Estimated Time For Operation (Monitoring)	10 years
Estimated Capital Cost	$5,600,000
Estimated O & M Cost(Present Worth)	$11,000,000
Estimated Total Cost(Present Worth)	$16,600,000

MM-3: Groundwater Extraction; On-Site Pretreatment with Off-Site Treatment and Disposal

This remedial alternative entails extracting contaminated groundwater from the overburden, pretreating it to meet industrial pretreatment discharge standards, and discharging it to a local Publicly Owned Treatment Works (POTW) for final treatment and discharge. The required pretreatment would most likely include chemical precipitation and air stripping with vapor phase activated carbon treatment for air emissions.

The pretreatment system design would depend on the discharge standards established by the State of New Hampshire and local agencies. The City of Manchester Waste Water Treatment Plant (WWTP) is the nearest secondary wastewater treatment plant with excess capacity and, therefore, would be the most likely choice for this alternative. The pretreated groundwater would be discharged to the Town of Londonderry sewers, which, in turn, would discharge to the Manchester WWTP. Therefore, the Londonderry

Sewer Commission, the Manchester Sewer Commission, and the New Hampshire Department of Environmental Services (NHDES) would determine the discharge standards that would be established through review of the discharge permit application.

The groundwater collection system would be the same as for Alternative MM-2. In order to meet anticipated pre-treatment standards, the treatment system for this alternative would be similar to that contained in Alternative MM-2, with the exception that activated carbon polishing would not be required for the effluent. Following air stripping, the pretreated groundwater would be discharged directly to the municipal sewer. Since the nearest sewer main that discharges to the Manchester WWTP is located at the intersection of New Hampshire Route 28 and Perkins Road in Londonderry, approximately 8,000 feet of 4-inch diameter sewer main would have to be installed between the on-site treatment plant and the existing sewer main. A 10,000-gallon holding tank and a pumping station would also be installed to transport the treated groundwater.

Regularly scheduled sampling and analysis of the pretreatment system discharge would be required by the Londonderry and Manchester Sewer Commissions to ensure that pretreatment standards were being met. The sampling frequency and parameters analyzed would be determined by the commissions, based on the quality and volume of the water being discharged. A monthly sampling and analysis program with full EPA HSL analyses is anticipated. This collection and treatment system conceptual design would collect five pore-volume equivalents of overburden groundwater beneath the source areas in 10 years.

Alternative MM-3 is essentially equal to the proposed alternative MM-2. The same type of treatment equipment would be used, it would comply with all ARARs, its cost is essentially equivalent and it provides equal protection of public health and the environment as alternative MM-2. However, because of the need for formal agreements between the Manchester WWTP and the Londonderry Sewer Commission, this alternative is not as readily implementable as MM-2.

A detailed assessment of this alternative can be found on Pages 4-146 through 4-158 of the FS.

Estimated Time For Design & Construction	3 years
Estimated Time For Treatment Operation	10 years
Estimated Capital Cost	$4,100,000
Estimated O & M Cost(Present Worth)	$12,100,000
Estimated Total Cost(Present Worth)	$16,200,000

X. THE SELECTED REMEDY

The selected remedial action is a comprehensive approach for site remediation which includes a management of migration component (MM-2) and a source control component (SC-2). These components will be implemented as two operable units, referred to herein as Operable Unit II and III (Operable Unit I was a water line). A comprehensive approach is necessary in order to achieve the response objectives established for site remediation and the governing legal requirements.

A. Description of the Selected Remedy

1. Remedial Action Objectives/Cleanup Goals

The selected remedy was developed to satisfy the following remedial objectives which will guide the design of the remedy and be used to measure the success of the remedy.

a. Groundwater - Specific groundwater target cleanup levels will be met at the compliance boundary and in off-site locations in the remedial action in order to:

- Restore the contaminated portion of the aquifer to drinking water quality in as short a time as practicable; and

- Prevent the migration of contaminated groundwater into uncontaminated portions of the aquifer.

Groundwater contamination is primarily limited to volatile organic compounds and metals. In order to meet the groundwater objectives, target cleanup goals were developed and are presented in Table X-1.

The Agency's decision to restore the groundwater to drinking water quality at the compliance boundary was based on several factors. The Agency considered its Ground Water Protection Strategy (GWPS) (Office of Ground Water Protection, August, 1984) which provides guidance concerning how different groundwaters throughout the country should be classified and to what extent cleaning up a particular class of groundwater is appropriate. EPA also considered the Agency's draft Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites (October 1986).

The policy under the GWPS establishes groundwater protection goals based on "the highest beneficial uses to which groundwater having significant water resources value can presently or potentially be put." Guidelines for protection of aquifers are differentially based, relative to characteristics of vulnerability, use and value. Under the classification scheme, the groundwater at the Auburn Road Site is Class II groundwater. This groundwater is considered to be a current drinking water source since groundwater is used for drinking water within a two mile radius of the Site (the classification review area). Therefore, EPA has determined that the appropriate groundwater cleanup levels should be consistent with drinking water standards as set by MCL's, PMCL's and Health Advisories (Table X-1).

EPA believes that active restoration of the groundwater is appropriate for the Site. Although residences in the immediate vicinity of the Site are connected to a municipal water supply, there are residents in the area that obtain their water from either the overburden aquifer or bedrock aquifer systems. Continued migration of contaminants and/or increased development resulting in increased groundwater demand could result in impacts to downgradient wells in the future.

EPA chose the northern property boundary of the Site as part of the compliance boundary, that is, the point where groundwater will at a minimum meet cleanup goals established for the Site and be protective of public health and the environment. EPA also determined that the compliance boundary should extend parallel to the unnamed brook which is east of the Solid Waste Area. This is to insure that contaminated groundwater exceeding cleanup goals will not move easterly or discharge to the unnamed brook.

EPA chose this compliance boundary rather than a more restrictive boundary at the edge of each source area on the basis that the State of New Hampshire considers the entire Site to be a waste management facility. As such, the State Department of Environmental Services (NHDES), through N.H.R.S.A. 147-A:13, N.H.R.S.A. 147-B:1 and N.H. Code of Admin. Rules, He-P 1905.08(d)(1)(d), has the authority to restrict any activity at the Site which would be adverse to the public health and welfare, and to prevent exposure of humans and the environment to harmful quantities of hazardous waste or its constituents. Specifically, the NHDES has the authority to restrict land use within the area between the source areas and the compliance boundary after closure to insure that the closure devices, facilities and monitoring systems are not disturbed. The NHDES will exercise this authority consistently with the objectives of this response action.

Table X-1

Cleanup Goals
of Indicator Chemicals in Groundwater
Auburn Road Landfill, Londonderry, New Hampshire

Indicator Chemical[1]	Reference	Cleanup Level[1] (Goals)
Inorganics (ug/L)		
Arsenic	MCL	50
Lead	MCL	50
Volatiles (ug/L)		
Vinyl chloride	MCL	2
Trans-1,2-dichloroethene	MCL	70
2-Butanone[2]	HA	172
Trichloroethene	MCL	5
Tetrachloroethene	PMCL	5
Toluene	PMCL	2,000
Benzene	MCL	5

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[1] Reference Subsection 2.3 of the FS for cleanup level discussion.

[2] The development of the clean-up goal for 2-Butanone is based on an EPA Health Advisory and as such is not an ARAR, but rather "To Be Considered" (TBC). If, during treatability studies to be conducted during design, EPA determines that the goal of 172 ppb cannot be obtained with the treatment system proposed, additional treatment methods and/or the appropriateness of this goal will be evaluated.

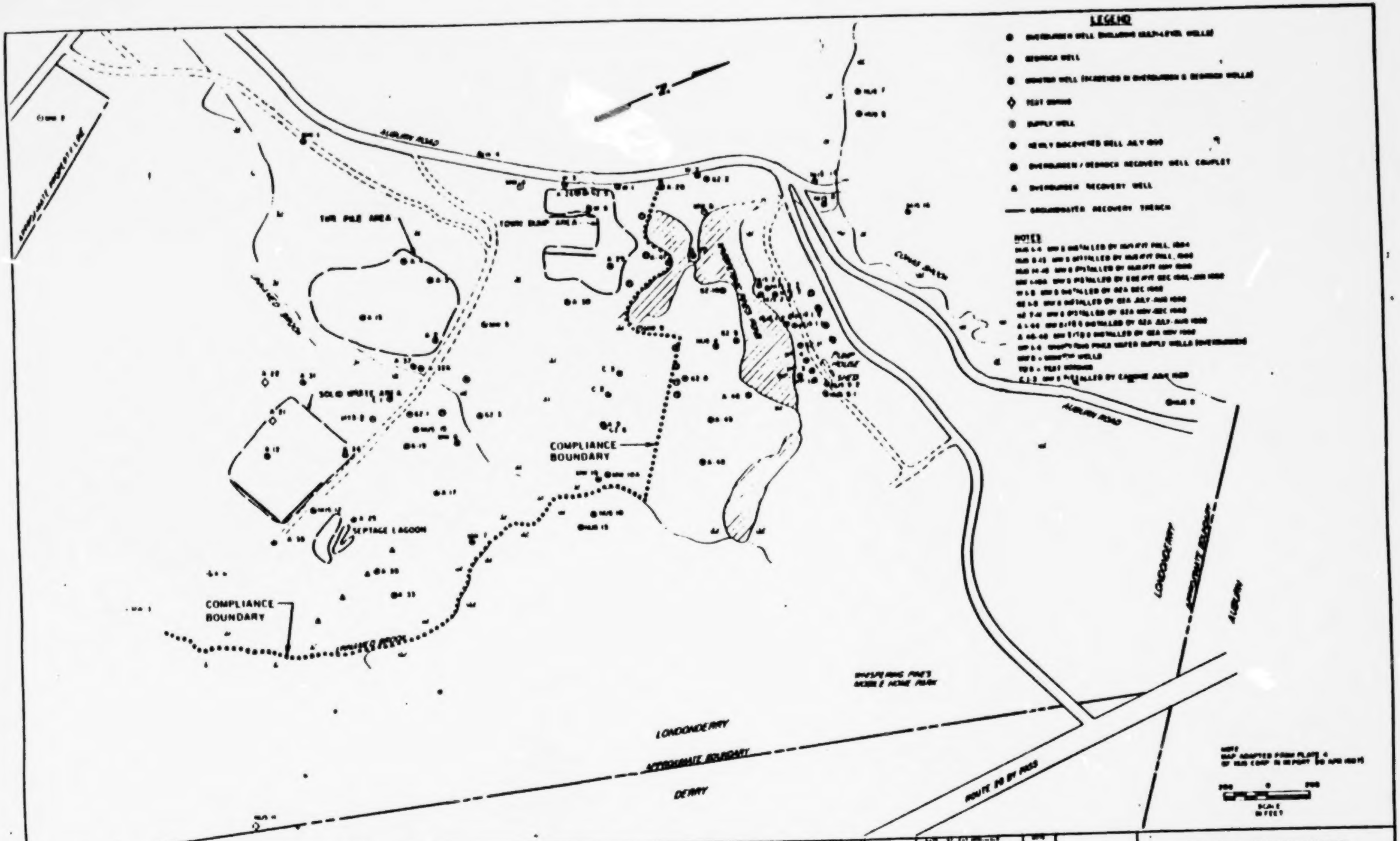
b. Soils - Specific soil cleanup goals were not developed because soil data presented in the Supplemental RI showed that the risks associated with direct contact and subsequent ingestionof on-site soils is already within the acceptable risk range of 10^{-4} to 10^{-7} established for Superfund sites. However, an objective of the remedial action is to reduce flushing of residual soil contamination to groundwater and also to prevent migration of these soils which could result in contamination of nearby surface waters.

2. Description of Remedial Components

a. Management of Migration MM-2 (Operable Unit II)

Groundwater contamination is primarily limited to volatile organics and metals. The groundwater treatment alternative would focus on the removal of these contaminants. The management of migration operable unit chosen (MM-2) will include groundwater collection and treatment. Groundwater will be collected by using a combination of overburden and bedrock wells and overburden collection trenches. The actual number and location of collection wells, as well as the location and length of the collection trenches, will be determined based on results of groundwater sampling conducted during the first phase of Remedial Design.

The collection system will be designed to recover contaminated groundwater immediately downgradient of each source area, along the compliance boundary and off-site north of the Whispering Pines Pond. Conceptually, the collection system will consist of shallow overburden wells and bedrock wells. Since the contamination is believed to be primarily in the deep overburden and shallow bedrock aquifer, the overburden wells will be screened just above bedrock while the bedrock wells will be screened in the top 15 feet of the bedrock. In addition, collection trenches, designed to intercept shallow contaminated groundwater as it moves off the source areas, may be installed in the old Town Dump and along the southern edge of the Solid Waste Area. Finally, collection wells will be installed off-site, north of the Whispering Pines Pond, to collect contaminated groundwater which has moved beyond the property boundary. Once extracted, groundwater will be treated through physical processes, to meet Federal and State drinking water standards prior to discharge to on-site recharge trenches located away from the source areas. Figure X-1 shows the proposed locations for the extraction wells and trenches, compliance boundary and recharge trenches.


LEGEND
NOTES
N
AUBURN ROAD
TIRE PILE AREA
TOWN DUMP AREA
SOLID WASTE AREA
SEPTAGE LAGOON
COMPLIANCE BOUNDARY
COMPLIANCE BOUNDARY
PUMP HOUSE
SHED
WHISPERING PINES MOBILE HOME PARK
LONDONDERRY
APPROXIMATE BOUNDARY
DERRY
AUBURN
ROUTE 28 BY PASS
SCALE IN FEET

AUBURN ROAD
LANDFILL SITE

WESTON

REVISED GROUNDWATER
RECOVERY SYSTEM

Figure X-1

Once collected, contaminated groundwater will first be treated through chemical coagulation and precipitation to reduce arsenic down to the goal of 50 parts per billion (ppb). In addition to removing arsenic, this process will also remove iron from the groundwater. Removing iron is desirable to prevent clogging of the organics treatment system (air-stripper). The clarified liquid produced in this operation would be stored temporarily prior to further treatment in the organics treatment system. The precipitate, or sludge (metallic hydroxide), from the metal removal process would be further thickened and would then be pumped to a filter press for dewatering. The dewatered sludge would consist primarily of iron, magnesium, and calcium hydroxide, and is expected to be considered non-hazardous. The sludge would be disposed of in a landfill constructed on-site specifically for this purpose. The landfill would be designed to hold only the estimated volume of sludge to be generated and would be constructed as the landfill described for Alternative SC-3.

Following treatment in the inorganics treatment system, the clarified contaminated groundwater would be pumped to an air stripping tower. VOCs would be driven from the water into the air stream, and removed in a vapor phase carbon adsorption system.

Air stripping is a relatively inexpensive, yet effective, means of removing these contaminants. Air stripping removes organic contaminants from groundwater by accelerating the evaporation process. The contaminated wastewater is sprayed downward over packed material in an enclosed upright metal tower, as clean air is pumped upward through the tower. The packing disperses the water as it cascades downward through the tower, to maximize air/water contact. Based on the gas-liquid equilibrium between the water and the air, the VOCs leave the water and enter the air stream. The cleaner wastewater is discharged from the tower bottom. The contaminated air stream is then discharged to a vapor phase carbon adsorption unit prior to atmospheric discharge.

Removal efficiencies will vary for the different types of chemical groups found at the Site. For most of the VOCs listed in Table X-1, the removal efficiency would range from 70 to approximately 99 percent. However, the removal efficiency for the 2-Butanone will range from only 10 to 25 percent. If after the air stripping process, the treated groundwater effluent still does not meet the Federal and State drinking water standards, it will be discharged to an activated carbon treatment unit for final treatment. If the goals for 2-Butanone cannot be obtained following air stripping, other treatment methods as well as the appropriateness of the goal will be evaluated. Following carbon adsorption, the treated effluent would be discharged back to the groundwater, away from the source areas, but still on-site.

The exhaust air, from the air-stripper, would be de-humidified and then passed through vapor-phase, activated-carbon units in which the VOCs would be removed. The exhaust air from the activated carbon units would then be discharged through an exhaust stack to the atmosphere. This exhaust will be monitored for total VOCs. Once VOC vapors are detected in the emission, the air stream will be manually redirected to an alternate vapor phase carbon bed for further treatment. The used carbon will be shipped off-site and thermally regenerated.

The treatment combination of chemical coagulation, air stripping and activated carbon will result in organic and metal concentrations which will be at or below the Federal and New Hampshire drinking water standards in the effluent from the treatment plant.

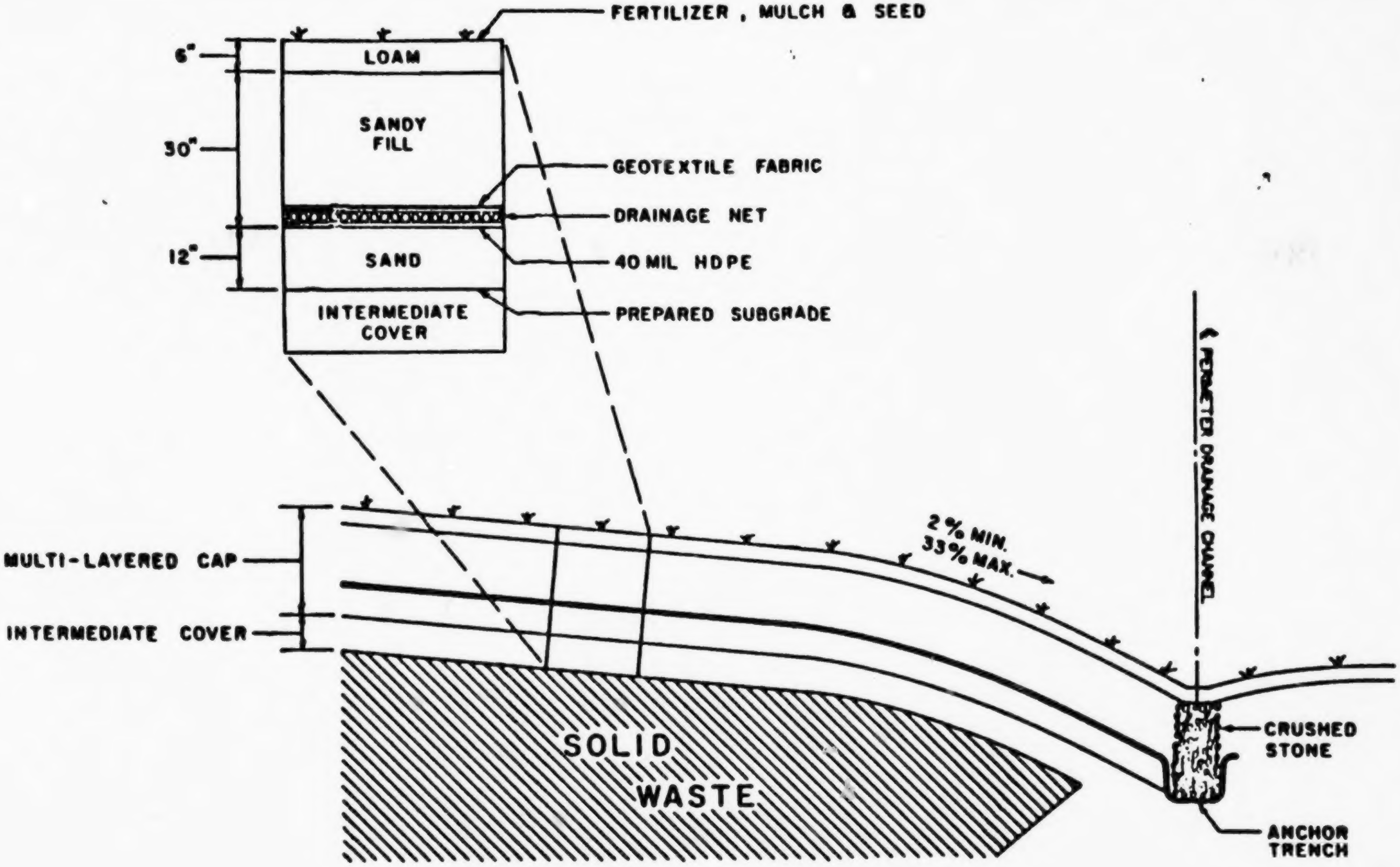
EPA has estimated that groundwater treatment will continue for six to ten years at a pumping rate of 195 to 250 gpm. This treatment period will allow for treating three to five complete pore volumes of groundwater from the overburden and shallow bedrock aquifer. Quarterly groundwater monitoring will be initiated during the remedial design phase and will continue through the post remediation period, both on and off-site, to track the effectiveness of the collection and treatment process.

When the cleanup goals are consistently met at the compliance boundary and throughout the off-site plume, and the cumulative risk of all remaining compounds falls within EPA's 10^{-4} to 10^{-7} acceptable risk range, then the collection and treatment systems will be turned off. Groundwater will then continue to be monitored quarterly for a period of three years. The monitoring network will be established during remedial design. If, during this three year monitoring period, the level of contamination begins to exceed the cleanup goals, the collection and treatment systems will be re-activated and remain on until such time as the goals are again consistently met, provided that the cumulative risk for that area falls within EPA's acceptable risk range. The collection system for either the on-site or off-site area may be turned off independently of each other once cleanup goals for that area are met. Groundwater monitoring will immediately begin once either collection system is turned off. However, the three year monitoring period will not begin until the treatment system is turned off. If the groundwater goals are not attained after ten years of collection and treatment, EPA will re-evaluate the appropriateness of the remedy and/or the cleanup goals. Once groundwater cleanup goals are maintained for the three year monitoring period, a monitoring program for the Site in accordance with New Hampshire Hazardous Waste and Solid Waste Rules will be implemented. Additionally, in accordance with CERCLA § 121(c), EPA will conduct a review of the Site every five years.

b. Source Control SC-2 (Operable Unit III)

The Source Control Operable Unit, (SC-2), will consist of placing a natural and synthetic cap over each disposal area. This operable unit may be implemented concurrently with groundwater treatment and will be accomplished with only minimal disturbance of existing waste material. The multi-layered cap system would meet NHDES requirements and also the relevant and appropriate portions of 40 CFR Part 264 relating to closure and post closure of waste units. At a minimum, this multilayered cap would consist of a vegetative topsoil layer, a subsurface drainage layer, and a low-permeability layer (barrier) that would underlie the drainage layer. Figure X-2 shows the cross section of a typical multi-layered cap. The vegetative layer would consist of topsoil (loam) that would support vegetation growth and facilitate drainage. This layer would protect the cap through soil stabilization and erosion control. Through evapotranspiration and drainage control, this layer would remove approximately 50 percent of infiltrating rainfall. Directly beneath the topsoil layer would be a layer of sandy soil that would promote sub-drainage of infiltrating precipitation and protect the underlying low-permeability layer. Additional soil to construct this layer may have to be purchased off-site.

The topsoil and sand layers would comprise a cover above the low-permeability layer and drainage netting. This cover would be sufficient to protect the underlying impermeable layer from frost. Infiltrating water would be captured and transported along the plane (surface) of the netting and discharged at the Site perimeter away from the area of contamination. An intervening layer of geotextile fabric would be placed between the drainage netting and overlying cover materials to prevent soil from entering the drainage zone. Beneath this intermediate drainage layer is the low-permeability layer. A synthetic liner composed of a high-density polyethylene material (HDPE) was chosen for the low-permeability layer. An HDPE liner can attain virtual impermeability, assuming good quality control. The 40-mil thick liner would be set at an approximate depth of 3 feet. The material has superior physical and chemical


FERTILIZER , MULCH & SEED
6"
LOAM
30"
SANDY FILL
GEOTEXTILE FABRIC
DRAINAGE NET
12"
SAND
40 MIL HDPE
INTERMEDIATE COVER
PREPARED SUBGRADE
℄ PERIMETER DRAINAGE CHANNEL
MULTI-LAYERED CAP
INTERMEDIATE COVER
2% MIN.
33% MAX.
SOLID WASTE
CRUSHED STONE
ANCHOR TRENCH

TYPICAL SECTION

NOT TO SCALE

IN-SITU CLOSURE / RCRA LANDFILL
(ALTERNATIVES SC-2, SC-3, SC-4, SC-5)
MULTI-LAYERED CAP

Figure X-2

characteristics and should be highly resistant to deterioration. The design life of an HDPE-cap system is indefinite with proper post-closure maintenance of the Site.

The selected low-permeability liner would be anchored at the ends to prevent slippage. An anchor trench would consist of an excavated earthen trench within which the liner cap would be placed. The liner would then be backfilled with appropriate drainage material and graded (or sloped) to permit removal of seepage. The vegetative layer would extend over the trench. The anchor trench also would function as a conduit for diverting rainfall infiltration to the surface drainage system for discharge directly to natural surface waters, since the infiltration would be clean and virtually free of sediment.

Because the current topography of the Site is not suitable for capping, grading and compaction would be required to form a proper sub-base for the cap. The final slope would be designed to remove surface irregularities, provide proper drainage, and prevent erosion. Grading of the Site would be accomplished with little or no disturbance of buried wastes. Approximately 150,000 cubic yards of soil materials from off-site sources is estimated for construction of the multilayer cap. During construction activities for this alternative, runoff and sedimentation would be controlled using silt fences and sedimentation ponds.

B. Rationale for Selection

The rationale for choosing the selected alternative is based on the assessment of each criteria listed in the evaluation of alternatives section of this document. In accordance with Section 121 of CERCLA, to be considered as a candidate for selection in the ROD, the alternative must have been found to be protective of human health and the environment and able to attain ARARs unless a waiver is granted. In assessing the alternatives that met these statutory requirements, EPA focused on the other evaluation criteria, including, short term effectiveness, long term effectiveness, implementability, use of treatment to permanently reduce the mobility, toxicity and volume, and cost. EPA also considered nontechnical factors that affect the implementability of a remedy, such as state and community acceptance. Based upon this assessment, taking into account the statutory preferences of CERCLA, EPA selected the following remedial approach for the Site.

1. Management of Migration

Chapter 4 of the FS presents a detailed evaluation of two management of migration alternatives (MM-2 and MM-3), which will satisfy the remedial groundwater objectives presented earlier in this section.

A comparison of Alternative MM-2, Groundwater Extraction/On-Site Treatment and Discharge, to Alternative MM-3, Groundwater Extraction/On-Site Treatment with Off-Site Disposal, shows that these alternatives are equal with respect to protection of human health and the environment, compliance with ARARs, short and long term effectiveness, and reduction in toxicity, mobility and volume. Both alternatives can be designed to provide the degree of treatment necessary to attain the established groundwater cleanup goals. Thus, they are equally protective of human health and the environment, and provide the same degree of reduction of toxicity, mobility and volume of the contamination in groundwater. Each alternative will provide the same degree of short term effectiveness in protection of the community and on-site workers, as well as in groundwater improvements as soon as each system is activated. As both alternatives are equal with respect to groundwater collection and utilize similar treatment technologies, the long term effectiveness of each in providing reliable treatment is equivalent. In terms of cost, although MM-3 appears to be slightly less costly, the difference in cost between the two alternatives is within the degree of accuracy (+50%, -30%) expected for these estimates. Therefore, these two alternatives are considered essentially equal in cost. MM-2 was chosen over MM-3 primarily on the basis of implementability. Implementation of MM-3 would require the construction of an 8,000 foot sewer main from the On-Site Treatment Facility to the nearest Town of Londonderry sewer. It would also be dependent on the willingness of the Manchester and Londonderry Sewer Commissions to accept the pretreated groundwater. Prior to implementing Alternative MM-3, an industrial discharge permit application that lists the types and concentrations of the contaminants present would be required by both commissions. The sewer commissioners would evaluate each hazardous constituent listed in the application to determine whether or not the Manchester WWTF could treat it, and whether or not the constituents would create hazardous conditions in the sewers. Representatives of the Town of Londonderry and residents of the Auburn Road area have expressed a preference for the implementation of Alternative MM-3 over Alternative MM-2. As discussed, EPA considers Alternatives MM-2 and MM-3 to be technically equal. If, at any time during design, the necessary agreements between the Town of Londonderry and the Manchester WWTP can be reached, and it can be shown that implementation of MM-3 would not have an adverse impact on local wetlands, then

Alternative MM-3 may be substituted for Alternative MM-2. The State of New Hampshire has stated at various public information meetings that it would support either MM-2 or MM-3. Table X-2 presents the capital and operation and maintenance costs for all of the Source Control and Management of Migration Alternatives evaluated.

2. Source Control

Chapter 4 of the FS also evaluated four source control alternatives which would provide a permanent solution to the remaining soil contamination at the Site. One of the alternatives, SC-7 Composting, is also considered an alternative treatment technology.

Alternatives SC-3, SC-4, SC-5, SC-6 and, SC-7 all involve excavation and treatment of all or some portion of the source materials. In the short term, while excavation is taking place, these alternatives present a greater risk of exposure for workers and nearby residents than SC-2. Once excavation is complete, each alternative is protective of human health and the environment. Each alternative could be constructed and operated to meet ARARs. All, except SC-2, would provide for some level of reduction of toxicity in the soils and, in the case of incineration, would also provide for reduction in volume. However, based on the most recent soil analyses presented in the Supplemental RI, the level of soil contamination found at each of the source areas is already within the range which EPA considers protective of human health for direct contact and subsequent ingestion of soils.

These alternatives are all equally implementable, as the equipment for each alternative is readily available. However, these alternatives are significantly more expensive than SC-2, the selected remedy, and do not provide an increased degree of protectiveness proportional to their cost. EPA has therefore determined that the selected source control remedy, SC-2, is both cost effective and protective.

XI. STATUTORY DETERMINATIONS

The remedial action selected for implementation at the Site is consistent with CERCLA and, to the extent practicable, the NCP. The selected remedy is protective of human health and the environment and attains ARARs. The selected remedy also offers the best combination of effectiveness, implementability, and cost in comparison with the other alternatives that provide the same level of protection. The selected remedy also satisfies

Table X-2

COST COMPARISON of ALTERNATIVES

SOURCE CONTROL ALTERNATIVES

		Capital Cost	O&M Cost ($/yr)	*Present Worth
SC-1	No Action	240,000	138,000	2,400,000
SC-2	In Situ Closure	5,100,000	160,000	7,500,000
SC-3	On-Site Incineration/In Situ Closure/On-Site Landfill	38,000,000	228,000	41,200,000
SC-4	Low Temperature Thermal Stripping/On-Site Landfill	31,300,000	104,000	32,700,000
SC-5	On-Site Incineration/On-Site Landfill	52,200,000	105,000	53,600,000
SC-6	Off-Site Treatment/Off-Site Landfill	190,000,000	0	190,000,000
SC-7	Composting/On-Site Landfill	28,400,000	104,000	29,800,000
	MANAGEMENT of MIGRATION			
MM-1	No Action	13,000	130,000	2,000,000
MM-2	Groundwater Recovery/ Treatment	5,600,000	1,300,000	16,600,000
MM-3	On-Site Pretreatment/Off-Site Treatment and Disposal	4,100,000	1,400,000	16,200,000

the statutory preference for a permanent solution and for treatment which reduces the mobility, toxicity or volume as a principal element. Additionally, the selected remedy utilizes alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

A. The Selected Remedy is Protective of Human Health and the Environment

The remedy at this Site will permanently reduce the risks presently posed to human health and the environment by contaminated groundwater. The Agency has selected cleanup goals in groundwater as presented in Table X-1, based on MCLs, PMCLs and Health Advisories. Vinyl chloride is a carcinogen with a MCL of 2 ppb. The risk associated with vinyl chloride at its MCL is 1.3×10^{-4}. However, vinyl chloride is also a compound which, due to its physical properties, is more readily removed from water than most other VOCs when subjected to the proposed aeration process. EPA expects that meeting or exceeding the treatment goals for the other VOCs will result in near total removal of vinyl chloride and therefore the remedy will be protective at completion.

The groundwater cleanup goal for inorganic arsenic is the MCL of 50 ppb. The excess lifetime risk associated with this concentration is estimated to be 2.5×10^{-3}. Because of several uncertainties which are currently unresolved on a scientific basis, this value may be overestimated by as much as an order of magnitude. EPA will consider any new information regarding arsenic and its associated cancer risk in reviewing the remedial action. To the extent required by law, EPA will review the Site at least once every five years after the initiation of remedial action to assure that the remedial action continues to protect human health and the environment. As described below, EPA will also evaluate the cumulative risk posed by the Site at the completion of the remedial action to insure that the remedy is protective. The groundwater remediation will continue until the goals for each compound are attained or exceeded at all locations at the compliance boundary and throughout the off-site plume. At that point, EPA will evaluate the cumulative risk of all compounds to insure that the total carcinogenic risk falls within EPA's 10^{-4} to 10^{-7} acceptable risk range[1] and the non-carcinogenic risks are at an acceptable level. Groundwater treatment will continue until both carcinogenic and non-carcinogenic cumulative risks are determined to be at acceptable levels. Although groundwater under the Site, primarily between the Solid Waste Area and the compliance boundary, may not meet the cleanup goals,

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[1] This evaluation will take into account EPA's policy regarding arsenic.

NHDES has sufficient authority to restrict land use on the Site to insure that public health and the environment will be adequately protected. Risks associated with direct contact and subsequent ingestion of soils are already within the acceptable range for superfund sites (10^{-4} to 10^{-7}). However, closure of the source areas with a cap, in accordance with State requirements and RCRA part 264, will further insure that the public will not come into direct contact with contaminated soils and will also prevent the possibility of snow melt or rain water from filtering down through the contaminants and adding to groundwater contamination.

As noted in Section IX above, Alternative MM-3 is as protective of human health and the environment as is Alternative MM-2.

B. The Selected Remedy Attains ARARs

This remedy will meet or attain all applicable or relevant and appropriate federal and state requirements that apply to the Site. Substantive portions of the environmental laws listed below are applicable or relevant and appropriate to the selected remedial action at the Site:

Resource Conservation and Recovery Act (RCRA)[2]
Clean Water Act (CWA)
Safe Drinking Water Act (SDWA)
Executive Order 11988 (Floodplain Management)
Executive Order 11990 (Protection of Wetlands)
Clean Air Act (CAA)
Occupational Safety and Health Administration (OSHA)
New Hampshire Surface-Water Quality Standards (Ws 430)
New Hampshire Protection of Ground Water Regulations(Ws 410)
New Hampshire Hazardous Waste Rules (He-P 1905)
New Hampshire Solid Waste Rules (He-P 1901)
New Hampshire Air Quality Rules (RSA Chapter 125-C)
New Hampshire Wetland Protection Rules (RSA 149 and RSA 483)

Table 2-1 and Table 2-2, in Chapter 2 of the FS, list the chemical specific and location specific ARARs, respectively, and outline the action which will be taken to attain the ARARs. Table 2-3 and Appendix E of the FS contain the action specific ARARs for all the alternatives, present a brief synopsis of the requirements, and outline the action which will be taken to attain the ARARs. The attached Table XI-1 presents the action-specific ARARs for the selected alternative.

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[2] New Hampshire is a RCRA authorized State program.

Table XI-2A

Action-Specific ARARs for Alternative SC-2: In Situ Closure

ARARs	Requirement Synopsis	Action to be Taken to Attain ARARs
RCRA regulations - Groundwater Protection (40 CFR 264.90-264.109)	These regulations detail the requirements for a groundwater monitoring program to be installed at the site.	A groundwater monitoring program would be designed, installed, and operated to assess the release of contamination from source areas to groundwater. Existing wells would be used as appropriate.
OSHA regulations - Safety and Health Standards for Federal Service Contracts	This document contains instructions concerning worker safety at RCRA or Superfund hazardous waste facilities.	All appropriate safety equipment would be on-site and appropriate procedures would be followed during remediation.
RCRA regulations - Standards for Owners and Operators of Permitted Hazardous Waste Facilities (40 CFR 264.10-264.18)	General facility requirements outline general waste analysis, security measures, inspections, training, and location requirements.	During all site work, a waste analysis plan would be written and maintained on-site. Entry to the site would be prevented by a 24-hour surveillance system and appropriate signs posted. A written inspection program would be developed, and all workers properly trained.
RCRA regulations (40 CFR 264.228 and 264.310)	These regulations detail the technical requirements for capping a RCRA facility.	The requirements would be used as guidance for design and construction of the cap.
RCRA regulations - Closure and Post-Closure (40 CFR 264.110-264.120)	These regulations detail the specific requirements for closure and post-closure of hazardous waste facilities.	Pathways of potential exposure would be limited. Untreated hazardous and nonhazardous wastes would be capped but not contained. The 30-year post-closure plan required for a landfill would include monitoring and maintaining the cap, removing liquid from the leachate collection system, and monitoring groundwater quality.

Table XI-2A
(continued)

ARARs	Requirement Synopsis	Action to be Taken to Attain ARARs
CAA regulations - National Ambient Air Quality Standards for Total Suspended Particulates (40 CFR 129.105, 750)	These regulations specify maximum primary and secondary 24-hour concentrations for particulate matter.	Fugitive dust emissions from site activities would be maintained below 150 ug/cu m (secondary standard) by water sprays and other dust suppressants.
Protection of Archaeological Resources (32 CFR 229, 229.4)	These regulations develop procedures for the protection of archaeological resources.	If archaeological resources are encountered during soil excavation, work would be stopped until the area has been reviewed by federal and state archaeologists.
CWA regulations (40 CFR 122)	These regulations address discharges to surface waters.	Groundwater collected by the groundwater depression system at each source area would be treated to effluent quality appropriate for the point of discharge.
NHDES Hazardous Waste Management Regulations - Waste Facility Security Requirements (NH Admin. Code He-P 1905.08(d))	Incorporates, by reference, 40 CFR 264.14 - General facility requirement for security measures.	During all site work, entry to the site would be prevented by a 24-hour surveillance system. Appropriate signs would be posted.
NHDES Hazardous Waste Management Regulations - Personnel Training (NH Admin. Code He-P 1905(d)(4)(e))	Incorporates, by reference, 40 CFR 264.16 - General facility requirement for personnel training.	During all site work, personnel would be properly trained. Written records of such training would be maintained.
NHDES Hazardous Waste Management Regulations - Location Standards (NH Admin. Code He-P 1905(d)(4)(g))	Incorporates, by reference, 40 CFR 264.18 - Location requirement for landfills.	The landfill facilities would be located, designed, and operated according to these regulations.

Table XI-2A
(continued)

ARARs	Requirement Synopsis	Action to be Taken to Attain ARARs
NHDES Hazardous Waste Management Regulations - Preparedness and Prevention (NH Admin. Code He-P 1905.08(d)(4)(h))	Incorporates, by reference, 40 CFR 264.30-264.31 - Requirements for safety programs and spill control.	During all site work, safety and communication equipment would be installed. Local emergency response authorities would be familiarized with the site.
NHDES Hazardous Waste Management Regulations - Contingency Plan (NH Admin. Code He-P 1905.08(d)(4)(i))	Incorporates, by reference, 40 CFR 264.50-264.56 - Requirements for contingency plan and emergency procedures.	Plans and emergency procedures would be developed during the remedial design and implemented during the remedial action. Copies of the plans would be kept on-site at all times.
NHDES Hazardous Waste Management Regulations - Closure and Post-Closure (NH Admin. Code He-P 1905.08(d)(4)(k))	Incorporates, by reference, 40 CFR 264.110-264.120 - Specific requirements for closure and post-closure activities at hazardous waste facilities.	Residual contamination must have low mobility and toxicity, and pathways of potential exposure must be limited. Treated hazardous wastes and untreated non-hazardous wastes would be contained in the landfill cell. The 30-year post-closure plan required for a landfill would include monitoring and maintaining the cap, removing liquid from the leachate collection system, and monitoring groundwater quality.
NHDES Hazardous Waste Management Regulations - Groundwater Protection (NH Admin. Code He-P 1905.08(d)(4)(j))	Incorporates, by reference, 40 CFR 264.90-264.109 - Establishes additional standards for groundwater monitoring and appropriate remediation at hazardous waste facilities. The provision prohibits the discharge of contaminants into groundwater, above Federal RCRA limits, for such contaminants at the compliance point (the boundary of each waste management unit under 40 CFR 264.95).	A groundwater monitoring and protection program would be implemented, in accordance with this provision.
NHDES Hazardous Waste Management Regulations - Transfer of Facility (NH Admin. Code He-P 1905.08(d)(5))	Requirement establishes requirements for notifying the Division and future owners or operators when the facility is transferred.	Compliance with this provision would be required prior to any transfer of facility ownership or operation.

Table XI-2A
(continued)

ARARs	Requirement Synopsis	Action to be Taken to Attain ARARs
NHDES Hazardous Waste Management Regulations - Monitoring (NH Admin. Code He-P 1905.08(d)(6))	Requirement establishes groundwater monitoring requirements and authorizes the Division to require other appropriate environmental monitoring.	Groundwater monitoring would be required; additional monitoring, including air emissions testing, might be necessary to detect releases of fugitive dust or VOCs during remedial activities
NHDES Hazardous Waste Management Regulations - General Environmental Standards (NH Admin. Code He-P 1905.08(d)(1))	Requirement requires facilities to comply with specified state and Federal environmental standards and to provide protection to workers in accordance with state and Federal occupational health and safety requirements. Applicable occupational standards include 29 CFR 1910 (industry standards); 29 CFR 1926 (safety and health standards); NH RSA 277-A (Worker's Right-to-Know Act); NH Admin. Code He-P 1800, Part 1803 (toxic substances in the workplace).	Facility operation must comply with environmental and occupational safety requirements
NHDES Hazardous Waste Management Regulations - General Design Standards (NH Admin. Code He-P 1905.08(d)(2))	Requirement establishes general facility design standards to prevent release of hazardous constituents.	Plans for the facility would be required to incorporate these design standards to control releases of hazardous constituents.

Table XI-2A
(continued)

ARARs	Requirement Synopsis	Action to be Taken to Attain ARARs
NHDES Hazardous Waste Management Regulations - Additional Technical Standards for Treatment (NH Admin. Code He-P 1905.08(f)(2)(a))	Requires a demonstration that proposed treatment methods will meet specified design and construction requirements.	The owner/operator of a treatment facility must demonstrate that the technology will be effective; will include automatic controls to stop inflow in any continuous flow process; will control toxic gases or fumes; and will meet other design requirements of this provision.
NHDES Hazardous Waste Management Regulations - Storage Standards (NH Admin. Code He-P 1905.08(f)(2)(c))	Requirement specifies design and construction standards for facilities that store hazardous wastes.	The owner/operator of a facility must minimize any danger to human health or the environment, must include mechanisms to prevent and detect releases to the environment, and must otherwise comply with design standards set forth in this provision, while storing hazardous wastes, groundwater treatment residuals, and contaminated soils.
NHDES Hazardous Waste Management Regulations - Technical Standards for Waste Piles (NH Admin. Code He-P 1905.08(f)(1)(d), incorporating, by reference, 40 CFR 264, Subpart L)	Requirements incorporate Federal RCRA standards for waste piles.	The owner/operator of the facility must operate any waste pile in accordance with 40 CFR 264, Subpart L.
NHDES Hazardous Waste Management Regulations - Technical Standards for Use and Management of Containers (NH Admin. Code He-P 1905.08(f)(1)(a), incorporating, by reference, 40 CFR 264, Subpart I)	Requirements incorporate Federal RCRA standards for facilities that store containers of hazardous wastes.	The owner/operator must comply with the design and management standards for hazardous waste containers.

Table XI-2A
(continued)

ARARs	Requirement Synopsis	Action to be Taken to Attain ARARs
HDES Air Pollution Control Reg-lations - Air Pollutant Emissions NH Admin. Code, Air, Parts 604 hrough 606)	These provisions establish limits for the emission of air pollutants, including VOCs and hazardous air pollutants. Applicable standards include the most stringent of the following requirements: • Federal New Source Performance Standards (40 CFR 60) • Federal National Emission Standards for Hazardous Air Pollutants (40 CFR 61) • New Hampshire State Implementation Plan limits (see RSA 125-C:6; NH Admin. Code, Air 101.09 and Air 606.01).	The owner/operator of a hazardous waste facility must comply with the standards set forth in these provisions, including the limits on the release of volatile organic compound (VOC) contaminants into the environment. On-site air monitoring would be required to indicate low levels of volatile organic compounds in the ambient air, in and around the site. Measures would be taken during remedial action to prevent unpermitted air emissions from the site.
NHDES Air Pollution Control Regulations - Fugitive Dust Emissions (NH Admin. Code, Air, Part 1002)	This provision requires prevention, abatement, and control of fugitive dust during specified activities, including construction, excavation, and bulk hauling (see NH Admin. Code, Air 1002.02).	Thw owner/operator must control fugitive dust emissions, during and after site remediation.
NHDES Solid Waste Regulations - Treatment, Storage, and Disposal (TSD) Facilities (RSA Ch. 149-M, NH Solid Waste Management Act; NH Admin. Code He-P 1901)	These provisions establish standards applicable to the treatment, storage, and disposal of solid wastes and the closure of solid waste facilities.	The owner/operator of a solid waste facility must manage, store, treat, and dispose of nonhazardous wastes on-site, in accordance with the Solid Waste Management Act and the rules thereof.

Table XI-2B

Action-Specific ARARs for Alternative MM-2: Groundwater Recovery/Treatment

ARARs	Requirement Synopsis	Action to be Taken to Attain ARARs
RCRA regulations - Groundwater Protection (40 CFR 264.90-264.109)	These regulations detail the requirements for a groundwater monitoring program to be installed at the site.	A surface-water and groundwater monitoring program would be designed, installed, and operated to assess groundwater contamination migration. New and existing wells would be used as appropriate.
RCRA regulations - Closure and Post-Closure (40 CFR 264.110-264.120)	These regulations detail the specific requirements for closure and post-closure of hazardous waste facilities.	This alternative is not expected to attain this ARAR. Contaminant levels would remain above groundwater standards and criteria for a period of years.
NHDES Hazardous Waste Management Regulations - Personnel Training (NH Admin. Code He-P 1905(d)(4)(e))	Incorporates, by reference, 40 CFR 264.16 - General facility requirement for personnel training.	During all site work, personnel would be properly trained. Written records of such training would be maintained.
NHDES Hazardous Waste Management Regulations - Location Standards (NH Admin. Code He-P 1905(d)(4)(g))	Incorporates, by reference, 40 CFR 264.18 - Location requirement for landfills.	The landfill facilities would be located, designed, and operated according to these regulations.
NHDES Hazardous Waste Management Regulations - Preparedness and Prevention (NH Admin. Code He-P 1905.08(d)(4)(h))	Incorporates, by reference, 40 CFR 264.30-264.31 - Requirements for safety programs and spill control.	During all site work, safety and communication equipment would be installed. Local emergency response authorities would be familiarized with the site.
NHDES Hazardous Waste Management Regulations - Contingency Plan (NH Admin. Code He-P 1905.08(d)(4)(i))	Incorporates, by reference, 40 CFR 264.50-264.56 - Requirements for contingency plan and emergency procedures.	Plans and emergency procedures would be developed during the remedial design and implemented during the remedial action. Copies of the plans would be kept on-site at all times.
NHDES Hazardous Waste Management Regulations - Closure and Post-Closure (NH Admin. Code He-P 1905.08(d)(4)(k))	Incorporates, by reference, 40 CFR 264.110-264.120 - Specific requirements for closure and post-closure activities at hazardous waste facilities.	Residual contamination must have low mobility and toxicity, and pathways of potential exposure must be limited. Treated hazardous wastes and untreated non-hazardous wastes would be contained in the landfill cell. The 30-year post-closure plan required for a landfill would include monitoring and maintaining the cap, removing liquid from the leachate collection system, and monitoring groundwater quality.

Table XI-2B
(continued)

ARARs	Requirement Synopsis	Action to be Taken to Attain ARARs
NHDES Hazardous Waste Management Regulations - Groundwater Protection (NH Admin. Code He-P 1905.08(d)(4)(j))	Incorporates, by reference, 40 CFR 264.90-264.109 - Establishes additional standards for groundwater monitoring and appropriate remediation at hazardous waste facilities. The provision prohibits the discharge of contaminants into groundwater, above Federal RCRA limits, for such contaminants at the compliance point (the boundary of each waste management unit under 40 CFR 264.95).	A groundwater monitoring and protection program would be implemented, in accordance with this provision.
NHDES Hazardous Waste Management Regulations - Monitoring (NH Admin. Code He-P 1905.08(d)(6))	Requirement establishes groundwater monitoring requirements and authorizes the Division to require other appropriate environmental monitoring.	Groundwater monitoring would be required. Additional monitoring, including air emissions testing, might be necessary to detect releases of fugitive dust or VOCs during remedial activities.
NHDES Hazardous Waste Management Regulations - General Environmental Standards (NH Admin. Code He-P 1905.08(d)(1))	Requirement requires facilities to comply with specified state and Federal environmental standards and to provide protection to workers in accordance with state and Federal occupational health and safety requirements. Applicable occupational standards include 29 CFR 1910 (industry standards); 29 CFR 1926 (safety and health standards); NH RSA 277-A (Worker's Right-to-Know Act); NH Admin. Code He-P 1800, Part 1803 (toxic substances in the workplace).	Facility operation must comply with environmental and occupational safety requirements.
NHDES Hazardous Waste Management Regulations - General Design Standards (NH Admin. Code He-P 1905.08(d)(2))	Requirement establishes general facility design standards to prevent release of hazardous constituents.	Plans for the facility would be required to incorporate these design standards to control releases of hazardous constituents.
NHDES Hazardous Waste Management Regulations - Additional Technical Standards for Treatment (NH Admin. Code He-P 1905.08(f)(2)(a))	Requires a demonstration that proposed treatment methods will meet specified design and construction requirements.	The owner/operator of a treatment facility must demonstrate that the technology will be effective; will include automatic controls to stop inflow in any continuous flow process; will control toxic gases or fumes; and will meet other design requirements of this provision.

Table XI-2B
(continued)

ARARs	Requirement Synopsis	Action to be Taken to Attain ARARs
NHDES Hazardous Waste Management Regulations - Storage Standards (NH Admin. Code He-P 1905.08(f)(2)(c))	Requirement specifies design and construction standards for facilities that store hazardous wastes.	The owner/operator of a facility must minimize any danger to human health or the environment, must include mechanisms to prevent and detect releases to the environment, and must otherwise comply with design standards set forth in this provision, while storing hazardous wastes, groundwater treatment residuals, and contaminated soils.
NHDES Hazardous Waste Management Regulations - Technical Standards for Waste Piles (NH Admin. Code He-P 1905.08(f)(1)(d), incorporating, by reference, 40 CFR 264, Subpart L)	Requirements incorporate Federal RCRA standards for waste piles.	The owner/operator of the facility must operate any waste pile in accordance with 40 CFR 264, Subpart L.
NHDES Hazardous Waste Management Regulations - Technical Standards for Use and Management of Containers (NH Admin. Code He-P 1905.08(f)(1)(a), incorporating, by reference, 40 CFR 264, Subpart I)	Requirements incorporate Federal RCRA standards for facilities that store containers of hazardous wastes.	The owner/operator must comply with the design and management standards of hazardous waste containers.
NHDES Hazardous Waste Management Regulations - Technical Standards for Tanks (NH Admin. Code He-P 1905.08(f)(1)(b), incorporating, by reference, 40 CFR 264, Subpart J)	Requirements incorporate Federal RCRA standards for facilities using tanks to treat or store hazardous wastes.	The owner/operator must comply with design and maintenance standards for storage tanks. The owner/operator must also implement regular tank inspection and maintenance in compliance with these requirements.
NHDES Hazardous Waste Management Regulations - Standards for Generators (NH Admin. Code He-P 1905.06)	Requirement establishes standards applicable to generators, including persons transporting hazardous wastes or treatment residues off-site.	The owner/operator of a facility generating wastes for transport off-site must comply with these requirements, including the performance of hazardous waste determinations and the maintenance of records regarding facility activities.

Table XI-2B
(continued)

ARARs	Requirement Synopsis	Action to be Taken to Attain ARARs
NHDES Hazardous Waste Management Regulations - Manifesting Requirements (NH Admin. Code He-P 1905.04)	Requires the transport of any hazardous wastes off-site to comply with the manifesting and recordkeeping requirements set forth in this provision.	The owner/operator must properly manifest and handle, in accordance with this provision, shipments of hazardous wastes, including treatment residuals, from the site for further treatment or disposal.
NHDES Hazardous Waste Management Regulations - Packaging and Labelling Requirements (NH Admin. Code He-P 1905.05, incorporating, by reference, NH Admin. Code Saf-C-600 and 49 CFR 172, 173, 178, and 179)	Requires hazardous wastes transported off-site to be packaged and labelled in accordance with New Hampshire Department of Safety rules and Federal transportation requirements.	The owner/operator must package and handle hazardous wastes, including treatment residuals, in compliance with this provision. Containers of hazardous wastes must be clearly marked and transport vehicles properly placarded, prior to off-site transport.
NHDES Solid Waste Regulations - Treatment, Storage, and Disposal (TSD) Facilities (RSA Ch. 149-M, NH Solid Waste Management Act; NH Admin. Code He-P 1901)	These provisions establish standards applicable to the treatment, storage, and disposal of solid wastes and the closure of solid waste facilities.	The owner/operator of a solid waste facility must manage, store, treat, and dispose of nonhazardous wastes on-site, in accordance with the Solid Waste Management Act and the rules thereof.
NHDES Air Pollution Control Regulations - Air Pollutant Emissions (NH Admin. Code, Air, Parts 604 through 606)	These provisions establish limits for the emission of air pollutants, including VOCs and hazardous air pollutants. Applicable standards include the most stringent of the following requirements: • Federal New Source Performance Standards (40 CFR 60) • Federal National Emission Standards for Hazardous Air Pollutants (40 CFR 61) • New Hampshire State Implementation Plan limits (see RSA 125-C:6; NH Admin. Code, Air 101.09 and Air 606.01).	The owner/operator of a hazardous waste facility must comply with the standards set forth in these provisions, including the limits on the release of volatile organic compound (VOC) contaminants into the environment. On-site air monitoring would be required to indicate low levels of volatile organic compounds in the ambient air, in and around the site. Measures would be taken during remedial action to prevent unpermitted air emissions from the site, including volatilization of soil contaminants, and to prevent the release of fugitive dust.

Table XI-2B
(continued)

ARARs	Requirement Synopsis	Action to be Taken to Attain ARARs
NHDES Air Pollution Control Regulations - Fugitive Dust Emissions (NH Admin. Code, Air, Part 1002)	This provision requires prevention, abatement, and control of fugitive dust during specified activities, including construction, excavation, and bulk hauling (see NH Admin. Code, Air 1002.02).	Thw owner/operator must control fugitive dust emissions, during and after site remediation.
OSHA regulations - Safety and Health Standards for Federal Service Contracts	This document contains instructions concerning worker safety at RCRA or Superfund hazardous waste facilities.	All appropriate safety equipment would be on-site and appropriate procedures would be followed during monitoring.
OSHA regulations - Recordkeeping, Reporting, and Related Regulations (29 CFR 1904)	These regulations outline the recordkeeping and reporting regulations for an employer under OSHA.	These regulations would be applicable to the construction company(ies) that would be contracted to perform monitoring on-site.
NHDES Hazardous Waste Management Regulations - Waste Facility Security Requirements (NH Admin. Code He-P 1905.08(d))	Incorporates, by reference, 40 CFR 264.14 - General facility requirement for security measures.	During all site work, entry to the site would be prevented by a 24-hour surveillance system. Appropriate signs would be posted.

The remedial action will involve the installation of groundwater collection wells and trenches, construction of a groundwater treatment facility and, placement of a natural and synthetic cap over each of the source areas. During all construction and operation activities OSHA requirements are applicable.

In the case of the selected remedy, SC-2 and MM-2, since no direct surface water discharge is anticipated, the requirements of the CWA are not applicable. However, CWA requirements are considered relevant and appropriate, and the recharge trenches will be placed so as to avoid any adverse impacts to nearby surface waters. If MM-3 is substituted for MM-2, then the CWA requirements are applicable, as this alternative involves discharging to a CWA-regulated treatment facility. Any pre-treatment permit required would have to be obtained.

Standards promulgated under the CAA for the discharge of particulates and other pollutants are considered relevant and appropriate to the exhaust discharge from the air stripper. Exhaust gases will be monitored to insure compliance. To ensure protectiveness, and consistent with EPA policy for providing air emission control for air strippers in ozone non-attainment areas, a carbon column will be installed following air stripping.

The Site is not a RCRA facility and therefore the requirements of RCRA are not applicable. However, because of the previous hazardous waste disposal practices at the Site and because hazardous substances still remain, the requirements of RCRA are considered relevant and appropriate. The design of the cap and the disposal cell for the groundwater treatment residuals will be in accordance with the relevant and appropriate portions of RCRA, particularly State standards under the State's authorized program that are more stringent than federal standards.

The cleanup goals for the Site were established to meet SDWA Maximum Contaminant Levels (MCLs). Although the MCLs are applicable to public water supplies, they are considered relevant and appropriate at this Site. In addition, Proposed MCLs, MCL Goals and EPA Health Advisories are considered to be TBCs. The groundwater beyond the compliance boundary is designated a Class II aquifer under EPA's Ground Water Protection Strategy and therefore suitable for drinking water. The cleanup goals were therefore established to insure the groundwater beyond the compliance boundary is of drinking quality.

Executive Order Nos. 11988 and 11990 deal with floodplain management and wetland protection, respectively. These orders are considered applicable. The groundwater treatment facility and recharge trenches will be designed and constructed so as not to encroach upon the 100 year floodplain or any nearby wetlands.

Finally, a description of the above-listed State ARARs and the actions needed to attain them can be found in Appendix F of the FS.

C. The Selected Remedial Action is Cost Effective

Of those remedial alternatives that are protective and attain ARARs, EPA selected a remedial alternative that is cost effective and achieves the cleanup goals.

There were only two alternatives for groundwater remediation evaluated in the detailed analysis chapter of the FS. As discussed in Section X of this document, both alternatives, MM-2 and MM-3, were considered equal in cost and protectiveness. EPA chose MM-2 rather than MM-3 only because of MM-2's relative ease of implementation compared to MM-3.

Although the source control alternatives SC-3, SC-4, SC-5, SC-6 and, SC-7 provide varying degrees of protectiveness greater than SC-2, SC-2 is also considered protective. However, the cost of each of these alternatives is significantly greater than the cost of SC-2. Taking into account the degree of protectiveness and its associated cost, EPA considers alternative SC-2 to be cost effective as it provides a degree of overall protection which is proportional to its cost.

D. The Selected Remedial Action Utilizes Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The principal elements of the remedy consist of removing contamination from the groundwater via air-stripping prior to discharging it back to the ground. The air-stripping process is a proven technique which provides a permanent solution to the contaminated groundwater. This process has been used successfully at other hazardous waste cleanup sites. As discussed in previous sections of this document, alternative MM-3 would also satisfy this requirement. No alternative treatment technologies are appropriate to groundwater remediation at the Site.

E. The Selected Remedy Satisfies the Preference for Treatment as a Principal Element

The principal element of the selected remedy is the management of migration portion of the selected remedy. This element addresses the primary threat at the Site, contamination of the groundwater by VOCs and arsenic. The selected remedy satisfies the statutory preference for treatment as a principal element by treating the VOCs and arsenic contamination to acceptable levels through use of Air Stripping and Carbon Adsorption.

XII. STATE ROLE

The New Hampshire Department of Environmental Services has reviewed the various alternatives and has indicated its support for the selected remedy. The State has also reviewed the RI, EA and FS to determine if the selected remedy is in compliance with applicable or relevant and appropriate State environmental laws and regulations. The State of New Hampshire concurs with the selected remedy for the Auburn Road Landfill Site. A copy of the declaration of concurrence is attached as Appendix B.

APPENDIX A

RESPONSIVENESS SUMMARY

EPA CONTRACT NO. 68-W9-0036

EPA WORK ASSIGNMENT NO. 01-1L53

EPA PROJECT OFFICER: NANCY BARMAKIAN
EPA REMEDIAL PROJECT MANAGER: CHESTER JANOWSKI

FINAL RESPONSIVENESS SUMMARY
AUBURN ROAD LANDFILL SITE
LONDONDERRY, NEW HAMPSHIRE

SEPTEMBER 1989

PREPARED BY:

ICF TECHNOLOGY, INC.
UNDER SUBCONTRACT TO
METCALF & EDDY, INC.

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ATTACHMENT D - COST AND SENSITIVITY ANALYSIS TABLES

Preface

The U.S. Environmental Protection Agency (EPA) held a 49-day public comment period from March 31, 1989 to May 18, 1989 to provide an opportunity for interested parties to comment on the Remedial Investigation (RI), Endangerment Assessment (EA), Feasibility Study (FS), and the Proposed Plan prepared for the Auburn Road Landfill Superfund site (the Site) in Londonderry, New Hampshire. EPA made a preliminary recommendation of its preferred alternative for site remediation in the Proposed Plan issued on March 22, 1989, before the start of the public comment period.

The purpose of this Responsiveness Summary is to document EPA responses to the comments and questions raised during the public comment period. EPA will consider all of the comments summarized in this document before selecting a final remedial alternative to address contamination at the Site.

This Responsiveness Summary is organized in the following sections:

I. Overview of Remedial Alternatives Considered in the Feasibility Study and Proposed Plan - This section briefly outlines the remedial alternatives evaluated in the FS and Proposed Plan, including EPA's preliminary recommendation of a preferred alternative.

II. Site History and Background on Community Involvement and Concerns - This section provides a brief site history, and a general overview of community interests and concerns regarding the Site.

III. Summary of Comments Received During the Public Comment Period and EPA Responses to These Comments - This section summarizes and provides EPA responses to the comments received from residents and other interested parties during the public comment period. In addition, comments received from the Potentially Responsible Parties (PRPs) are summarized and EPA's responses to these comments are provided.

IV. Remaining Concerns - This section summarizes comments raised during the public comment period that cannot be fully addressed at this stage of the Superfund process and which thus may continue to be of concern during the design and implementation of EPA's selected remedy for the Site. EPA provides responses to these comments and will address these concerns during the Remedial Design and Remedial Action (RD/RA) phase of the cleanup process.

Attachment A - This attachment provides a list of the community relations activities that EPA has conducted to date at the Site.

Attachment B - This section contains a detailed summary of Potentially Responsible Parties' comments.

Attachment C - This attachment provides a transcript of the April 25, 1989 informal public hearing on the Site, held in Londonderry, New Hampshire.

I. OVERVIEW OF REMEDIAL ALTERNATIVES CONSIDERED IN THE FEASIBILITY STUDY AND PROPOSED PLAN

Using information gathered during the RI (an investigation of the nature and extent of contamination at the Site) and the EA (an assessment of the potential risks to human health and the environment associated with the Site contamination), EPA identified several cleanup objectives for the Site.

The primary cleanup objective is to reduce the risks to public health and the environment posed by exposure to the on-site source areas or to contamination that has migrated, or may potentially migrate, off-site. Cleanup goals for soils are set at levels intended to attain the desired cleanup of the groundwater that EPA considers to be protective of public health and the environment.

After identifying the cleanup objectives, EPA developed and evaluated potential cleanup alternatives, called remedial alternatives. The FS report describes the remedial alternatives considered for addressing contamination of soil and groundwater, as well as the criteria EPA used to narrow the list to seven potential source control (SC) remedial alternatives and three potential management of migration (MM) remedial alternatives.

EPA's preliminary recommendation of a preferred alternative to address the different aspects of Site contamination includes: 1) constructing multi-layer caps over each disposal area; and 2) extracting contaminated groundwater and treating it by air stripping.

REMEDIAL ALTERNATIVES EVALUATED IN THE FS

The 10 remedial alternatives considered by EPA are listed below. The March 1989 Proposed Plan should be consulted for a detailed explanation of these remedial alternatives as well as EPA's preferred alternative.

Alternatives to Address Soil Contamination

Alternative SC-1: No Action

Alternative SC-2: In-Situ Closure of the Source Areas
EPA has recommended this as the preferred SC alternative.

Alternative SC-3: On-Site Incineration/Capping of Solid Waste Area/On-Site Landfill

Alternative SC-4: Excavation (All Source Areas)/On-Site Low-Temperature Thermal Stripping/On-site Landfill

Alternative SC-5: Excavation (All Source Areas)/On-site Incineration/On-Site Landfill

Alternative SC-6: Excavation (All Source Areas)/Off-Site Treatment and Disposal

Alternative SC-7: Excavation (All Source Areas)/On-Site Composting - On-Site Landfill/Off-Site Treatment - Off-Site Landfill

Alternatives to Address Groundwater Contamination

Alternative MM-1: No-Action

Alternative MM-2: On-Site Treatment by Extraction/Chemical Precipitation/Air Stripping/Carbon Treatment
EPA has recommended this as the preferred MM alternative.

Alternative MM-3: Off-Site Treatment of Groundwater

II. SITE HISTORY AND BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The Site is a 200-acre parcel of land in the northeastern corner of Londonderry, New Hampshire. The Site has been the location of sand and gravel mining operations from the late 1940s to the present. Waste disposal occurred on the Site in four primary areas -- the Town Dump, the Tire Dump, the Septage Lagoon, and the Solid Waste area -- each of which covers from one-half to five acres. The Town Dump operated during the 1960s for landfilling of municipal waste, and was the disposal site for over a thousand drums of chemical waste. The Tire Dump was primarily used for the disposal of tires and demolition debris, and also was the disposal site for several hundred drums of chemical waste. For a short time, in the mid-1970s, when the Tire Dump area was filled to capacity, landfilling operations shifted to a waste mound next to the Septage Lagoon. The most recent landfilling occurred in the Solid Waste area, which appears to be the largest on-site disposal area. The Solid Waste area was active until the entire Site was closed in January 1980.

EPA involvement with the Site commenced following the discovery by the State of New Hampshire of contaminants in surface water on and near the Site and groundwater samples from residential wells and monitoring wells. The four disposal areas on-site were determined to be the source of the groundwater contamination, and so are referred to as "source areas." In 1983, due to the presence of this contamination, the Site was added to the Superfund National Priorities List (NPL), a list of the nation's hazardous waste sites eligible to receive Federal Superfund monies for cleanup.

In 1986, EPA conducted a removal action at the Site, consisting of excavating and removing 1,954 drums, primarily from the Town Dump area. Also in 1986, as part of a long-term Superfund remedial action, EPA completed a RI, which further defined the nature and extent of contamination in the study area, and a Focused Feasibility Study (FFS), which analyzed remedial alternatives to address hazards posed by the contamination.

The 1986 RI identified over 80 different contaminants in the soils, air, surface water and groundwater at the Site. EPA determined that the contaminated groundwater flowing off-site toward the drinking water supply wells at the nearby Whispering Pines Mobile Home Park, and potentially to other private residential wells on Auburn Road, posed a potential risk to human health and the environment. A replacement waterline to area residents, which EPA identified in the FFS to be the most protective of human health, became operational in December 1987. It was constructed and paid for by the Town of Londonderry (the Town), one of the former operators of the Site under an administrative order issued by EPA.

EPA recently completed a Supplemental RI to collect additional information necessary to select an overall cleanup plan to address the four source areas and contaminated groundwater on-site. In 1988, while conducting field activities for the Supplemental RI, EPA discovered 360 additional drums buried in the Tire Dump. EPA subsequently excavated and removed these drums.

Using data collected during the RI and Supplemental RI, EPA developed a FS that includes the seven SC remedial alternatives to address the four landfill areas, and the three MM remedial alternatives to address contaminated groundwater.

One of the Town residents' foremost concerns continues to be the possibility that all of the barrels have not been removed. They question what action would be taken should either more barrels or contaminants be found on the Site in the future. Many citizens have also expressed concern regarding the extent of groundwater contamination, as well as the possibility that private wells may have been contaminated before EPA established an alternative drinking water source. Citizens continue to be concerned about the possible adverse economic impact the Site could have on the Town.

A complete list of community relations activities conducted at the Site is included in Attachment A at the end of this document.

III. SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA RESPONSES TO THESE COMMENTS

This Responsiveness Summary summarizes the comments EPA received during the public comment period held from March 31, 1989, to May 18, 1989. Eight sets of written comments were received: 1 from a resident, 1 from an interested party and 6 from potentially responsible parties (PRPs). In addition, four oral comments were received at the informal public hearing held on April 25, 1989. All of these comments are summarized below and a detailed summary of PRP comments is included in Attachment B. A copy of the transcript from the informal public hearing is included in Attachment C of this document and is available at the Site information repositories at the Londonderry Town Hall, Londonderry Public Library, and at the EPA Records Center, 90 Canal Street, Boston, Massachusetts.

A. Summary of Resident and Other Interested Party Comments

Comments from a resident and an interested party, are summarized below, along with EPA responses. The comments are organized in the following three categories: 1) Potentially Responsible Parties; 2) EPA's Preferred Alternative; and 3) Miscellaneous Comments.

1. Potentially Responsible Parties

Comment a: One resident asked whether any of the PRPs could propose to EPA one of the other more comprehensive and costly options outlined in the FS, or whether EPA would prevent the PRPs from implementing a more comprehensive cleanup option, if they offered to do so.

EPA's Response: Once EPA has issued its Record of Decision, which will specify the cleanup option to be implemented, EPA will enter into negotiations with the responsible parties in an attempt to have the PRPs either pay for the cleanup or implement the remedy themselves. If, during those negotiations, the PRPs propose to implement a remedy more protective than what EPA requires and if EPA agrees with such a proposal, EPA will issue a revised Record of Decision and solicit public comment concerning the changes.

Comment b: One resident referred to an article published in the March 13, 1970 Manchester Union Leader indicating that the State of New Hampshire was aware of hazardous materials being disposed of at the old town landfill, and asked why the State of New Hampshire has not been named as a PRP.

EPA's Response: Section 107 of the Comprehensive Environmental Response, Compensation and Liability Act, (CERCLA) as amended, sets forth the basis of liability at hazardous waste sites. Section 107(a) provides in part, that the owner or operator of a facility or any person who arranged for transportation or disposal of hazardous substances for transport to the facility is liable for all costs for investigation and cleanup. The mere awareness that hazardous substances were being disposed of at the Site is not grounds for liability under CERCLA. Therefore, the State of New Hampshire has not been designated as a PRP at this Site.

Comment c: One resident asked which PRPs have been identified as having directly deposited hazardous waste in the old town landfill.

EPA's Response: A list of all parties which EPA has identified as potentially responsible is presented in the Auburn Road Administrative Record and is available for public review. Specific evidence relating to the liability of particular PRPs is information which was compiled for enforcement purposes, the release of which would interfere with the Agency's enforcement proceeding. As such, it is confidential and exempt from public disclosure pursuant to the Freedom of Information Act, 5 U.S.C. §552(b)(7).

Comment d: One resident asked if the PRPs offered to excavate and contain all the waste in the old town landfill in a double-lined landfill, in a manner compliant with all State and Federal regulations, whether EPA would allow them to do so.

EPA's Response: Refer to Response to A.1.a.

2. EPA's Preferred Alternative

Comment a: One resident inquired what would happen 25 years from now after the Site is declared clean if more hazardous waste is found in the groundwater.

EPA's Response: EPA's proposed remedy for cleanup at the Site is expected to take from 6 to 10 years to complete. Once cleanup is complete, the State of New Hampshire will be responsible for monitoring the Site for 30 years. If, during that monitoring period, it becomes apparent that additional hazardous substances are being released which threaten public health or the environment, then EPA will reimplement the RI/FS procedures of 40 CFR §300.430 of the Proposed National Contingency Plan (NCP). These procedures would include, to the extent deemed necessary, developing a Supplemental Remedial Investigation to characterize the problem, preparing a Supplemental Feasibility to address various alternatives for correcting the problem, and issuing an amended Record of Decision.

Comment b: One resident asked when the old Town Dump will be capped under the proposed cleanup plan and whether the old town landfill could be capped before the groundwater cleanup is started in that area.

EPA's Response: As explained in the Record of Decision, since EPA is no longer proposing soil flushing, capping of all source areas will occur concurrently with groundwater remediation.

Comment c: One resident asked whether EPA could submit to him a letter stating that the implementation of the proposed cleanup plan would ensure safe conditions for human habitation of residential property within 500 feet of the hazardous waste site. In addition, the resident requested a letter from EPA stating that the proposed cleanup plan would have no adverse environmental effects on his property, which abuts the old town landfill. If EPA is unable to comply with his request, the citizen asked to know why.

EPA's Response: No one can definitively predict or guarantee the future, and EPA is no exception. EPA's ROD, however, constitutes a declaration of EPA's belief that the remedy selected is protective of human health and the environment. In coming to its decision, EPA evaluated the present and future potential risks to public health and the environment posed by the Site. Potential public health effects associated with the various contaminants in soil and groundwater were estimated quantitatively through the development of several hypothetical exposure scenarios. These scenarios included evaluating non-carcinogenic and carcinogenic effects on both adults and children associated with ingestion of groundwater, ingestion of soils and direct contact with soils. On the basis of these evaluations, EPA has concluded that the selected remedy is protective of public health and the environment both directly on the Site and in neighboring areas that may be affected by conditions on the Site. EPA will send you a copy of the ROD which, although not in the form of a letter, addresses the concerns you have inquired about to the best of the agency's ability.

Comment d: One resident asked whether EPA would consider a proposal to establish a resource recovery facility on-site as a viable cleanup option. The facility, which would comply with Federal and State regulations, would include on-site ash landfills. In addition, the proposal would involve excavating and containing all of the hazardous waste located on the property in double-lined landfills.

EPA's Response: In accordance with the National Contingency Plan (NCP) 40 CFR §300.68(i) and 40 CFR §300.430 of the Proposed NCP, EPA must select a cost-effective remedial alternative that effectively mitigates and minimizes threats to and provides adequate protection of public health and welfare and the environment. However, EPA would consider any good faith proposal made by a potentially responsible party which is as protective or more protective than EPA's selected remedy. If the PRP's proposal is acceptable but significantly different from EPA's selected remedy, EPA would, in accordance with 40 CFR §300.435 of the Proposed NCP, publish an explanation of the differences or amend the Record of Decision. In either case, an opportunity for public review and comment will be provided.

Comment e: One resident asked if there is any guarantee that hazardous waste will not migrate to nearby residences.

EPA's Response: Refer to Response to Comment A.2.c.

Comment f: One resident asked whether there would be restrictions placed on future use of the Site, and if so, what they would be.

EPA's Response: The proposed capping remedy will be designed to meet New Hampshire requirements for the proper closure of a landfill. The State of New Hampshire has declared the entire Site property as a waste management unit and as such has the authority, through N.H.R.S.A. 147-A:13

and 147-B:1 and the Code of Administrative Rules, He-P 1905.08(d)(1)(d), to restrict any activity at the Site which would be harmful to public health and welfare, and to prevent exposure of humans and the environment to harmful quantities of hazardous wastes. Any proposed use of the Site must receive State approval.

Comment g: One resident asked whether or not there would be any provision to ensure that buildings or other structures are not constructed on the Site after each area is capped and fenced.

EPA's Response: Refer to Response to Comment A.2.f.

Comment h: Whispering Pines requested that EPA reconsider its preliminary recommendation of Alternative MM-2 and Alternative SC-2 for the Site, and instead select Alternative MM-3 and either Alternative SC-3 or Alternative SC-5.

EPA's Response: In reaching its decision for the selected remedy, EPA was required to consider nine specific criteria (see Section VIII-B of the Record of Decision). In addition to community acceptance, EPA must also evaluate whether the remedy:

- Is protective of human health and the environment;
- Attains all Applicable or Relevant and Appropriate Requirements (ARARs);
- Provides for long-term effectiveness and permanence;
- Provides for reduction of toxicity, mobility or volume;
- Considers the short term effectiveness;
- Is implementable;
- Is cost effective and;
- Has State acceptance.

As discussed in Section XI-C of the Record of Decision, Alternative MM-3 is considered equivalent to the selected Alternative except that MM-2 is deemed to be more easily implemented because it does not require any discharge permits or intermunicipal agreements. As further discussed in the Record of Decision, if the agreements necessary to implement Alternative MM-3 can be obtained, then Alternative

MM-3 may be substituted for Alternative MM-2.

EPA agrees that both Alternative SC-3 and Alternative SC-5 would be protective of public health. However, EPA believes that Alternative SC-2 also provides for protection of public health and the environment and is substantially less expensive than either SC-3 or SC-5.

Comment i: Whispering Pines stated that they believe that Alternative MM-3 is far better than EPA's Preferred Alternative MM-2 for three reasons: a) many of the contaminants measured in August 1987 were already at or below levels whereby the water could be accepted by the Londonderry and Manchester sewage systems, (Whispering Pines also indicated their belief that a round of samplings in 1989 would expectably provide still lower concentrations of contaminants); b) according to the technical report, the aeration method is only 40% effective which would mean that contaminated groundwater would be reintroduced to the saturated and unsaturated zones; and c) the cost to implement Alternative MM-3 is projected to be $1,000,000 less than to implement Alternative MM-2.

EPA's Response: When evaluated using the EPA Evaluation Criteria, Alternatives MM-3 and MM-2 are very similar, with the primary difference being the rating for "administrative implementability". Alternative MM-3 received a lower rating than MM-2 for this criteria due to the uncertainty of obtaining permits and intermunicipal agreements which are beyond the control of the EPA. If at any time during design the necessary agreements between the Town and the Manchester WWTP are reached, and it can be demonstrated that off-site discharge would not have an adverse impact on local wetlands, then MM-3 could be substituted for MM-2.

EPA agrees that many, but not all, of the contaminants measured in 1987 were at or below levels typically accepted by the Manchester WWTP. However, EPA was informed by the Manchester WWTP that limitations for contaminated groundwater would be set on a case by case basis and are subject to review by the NHDES. The Manchester WWTP would consider whether the contaminants proposed for discharge would pass through the treatment plant without treatment, interfere with the operation of the plant, contribute to contamination of the sludge, or contribute to health hazards in the sewers or at the treatment plant. In the event the above-mentioned agreements are reached, the design basis of the groundwater treatment system would also be modified to reflect the effluent limitations specified in the agreement. It would not be appropriate to assume that the discharge agreement would allow discharge without pretreatment.

Point (b) of the comment suggests that inadequately treated groundwater will be discharged back on-site. This will not happen. Under the proposed plan, treated groundwater will not be discharged back on-site until the levels of contamination are reduced such that they will not cause the groundwater to exceed cleanup levels at the Site boundary. Air stripping would be used in combination with other unit operations, such as activated carbon, if necessary to meet the target levels. It is also possible that another treatment process could be substituted for this representative process option based on information gathered during Remedial Design.

Comment j: Whispering Pines stated its preference for EPA's Alternative SC-3 or Alternative SC-5. They said that unlike EPA's Preferred Alternative SC-2, which would leave all of the contaminated soil in place, these two alternatives provide a "permanent and irreversible" solution to soil contamination at the Site. They stated that this alternative would also require the least amount of time to implement.

EPA's Response: EPA agrees that Alternative SC-3 and SC-5, which involve incineration, provide a permanent and irreversible solution to soil contamination. However, EPA believes that the removal actions, which occurred in 1986 and 1988 and resulted in removal of approximately 2000 barrels of material, also provided a permanent and irreversible solution to soil contamination. Contaminant levels which remain are in the range considered to be protective of human health. Therefore, substantial expense of further removing contaminants from soils and wastes which are already protective of public health and the environment cannot be justified.

Comment k: Whispering Pines urged EPA, at the very least, to further review the test pit and soil contamination data to identify those areas showing the highest levels of contamination and to excavate and incinerate those specific soil clusters, as part of soil remediation at the Site.

EPA's Response: EPA believes that implementation of Alternative SC-2, capping is protective of public health and the environment. Incineration of areas showing the highest levels of contamination would provide minimal added protection of public health while substantially increasing the cost of the remedy. In accordance with 40 EFR §300.68 (i), EPA is required to select a remedy that is both cost effective and protective of public health and the environment.

3. Miscellaneous Comments

Comment a: **One** resident asked what risk potential exists for a child under the age of 15 living within 300 feet of the old town dump to develop cancer, and what the standard risk factor would be for a child under the age of 15 living near such a site to develop cancer.

EPA's Response: The exposure route for a person living near the Site, but not going on the Site, would be inhalation of contaminated soil (in the form of dust). Incremental carcinogenic risk for this exposure route was calculated using a set of very conservative assumptions, including:

- dust concentration in the inhaled air would always be at the National Ambient Air Quality Standard (NAAQS) for particulates (o.075 mg/m^3);
- all dust inhaled would have originated at the Auburn Road Landfill Site;
- the child would continue to reside at the Auburn Road location for his or her entire life (70 years); and
- the exposed person would be home-bound (that is, at the Auburn Road location 24 hours per day, 365 days per year for 70 years).

Note that the assumption that the child would continue to reside at Auburn Road is a conservative assumption. This would result in a higher incremental risk than a scenario which assumes the child is under the age of 15 and leaves the area upon reaching the age 15.

Based on this conservative scenario, the incremental carcinogenic risk due to inhalation of dust from the Site would be 2 X 10-5 (2 incidents in a population of 100,000).

There is no "standard risk factor" for a child living near an NPL site. The risk due to exposure to contamination at an NPL site is always expressed in terms of incremental risk, since EPA acknowledges that the carcinogenic risk due to exposures unrelated to the Site cannot be quantified.

Comment b: One resident asked what the cancer risks would be for an adult living within 300 feet of the old town dump, and for an adult living near such a site.

EPA's Response: The scenario developed in response to Comment III.A.3.a. addresses this comment with a conservative risk calculation based on a lifetime of exposure. The incremental carcinogenic risk stated above would be decreased by a factor of 10 if the exposed adult resided at Auburn Road for seven years, rather than the assumed 70 years.

Comment c: Several residents asked whether EPA has removed all the barrels buried at the Site and expressed the concern that all the barrels have not been removed.

EPA's Response: EPA has undertaken significant efforts to determine whether and where barrels may be buried at the Site. These efforts have included magnetic, electromagnetic, and ground penetrating radar studies and subsurface investigations. Short of total excavation of the Town Dump, Tire Dump and Solid Waste Area, however, there will always be a possibility that a barrel was not detected and removed during the previous removal activities which took place in 1986 and 1988. Still EPA believes, that, because of the extensive amount of investigative work performed at the Site during development of the Remedial Investigation and Supplemental Remedial Investigation Reports, it is unlikely that large numbers of barrels remain buried at the Site.

Comment d: One resident asked if additional barrels on the Site are found to rupture and spread contaminants 15 or 20 years from now, who would be responsible for the cleanup: the PRPs or the Federal government.

EPA's Response: In accordance with the Proposed NCP and Section 121(c) of CERCLA as amended by SARA, if EPA selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the Site, as will be the case in the Auburn Road Landfill site, EPA shall review the remedial action at least once every 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action. If upon such review, EPA determines that additional action is appropriate and necessary to protect the public health or the environment, then EPA will either initiate the appropriate and necessary action or direct the PRPs to take such action.

Comment e: One resident asked whether any area of the Site could be used for a new landfill.

EPA's Response: As noted in the response to Comment A.2.f., any future use of the Site will be subject to State review and approval.

Comment f: The New Hampshire Department of Environmental Services (DES) expressed their concurrence with EPA's Proposed Plan, and offered their continued assistance to EPA, the Londonderry Sewer Commission and the Manchester Water Works in an effort to come to an agreement regarding the discharge of water to the Manchester Publically Owned Treatment Works (POTW).

EPA's Response: No Response Required

B. Summary of Potentially Responsible Party Comments

Six sets of written comments were received from PRPs, including:

- Peter A. Johnson and Grassy Knolls Associates (Peter Johnson);
- Work Place Systems;
- the Town;
- Sanders;
- Xentex Company (Xentex); and
- a group of nine PRPs, (BASF Corporation; Disogrin Industries Corporation; General Latex and Chemical Corporation; Peter Johnson; Sanders a Lockheed Company; the Town; Waste Management of North America, Incorporated; Workplace Systems, Incorporated; and W.R. Grace - Conn) who sponsored a report by Canonie Environmental Services Corporation (Canonie).

In addition, one PRP representative offered oral comments at the public hearing.

The main points made by each of these PRPs are summarized briefly below. A more detailed summary of PRP comments is included in Attachment B. The PRP comments are organized in the following three categories: 1) EPA's Preferred Alternative; 2) The Supplemental RI/FS; and 3) the Removal Action.

1. EPA's Preferred Alternative.

Comment a: Work Place Systems stated that there is not enough data available regarding the distribution and migration of site contamination in the overburden and bedrock aquifer to support Alternative MM-2.

EPA's Response: The groundwater collection and recharge scheme presented for Alternative MM-2 is conceptual in nature and consistent with the level of design recommended by EPA RI/FS guidance. The information collected adequately supports EPA's conclusion that target cleanup levels are not being met, and supports the selection of a remedial alternative consisting of groundwater collection, on-site treatment and discharge.

Water quality data acquired by the EPA is adequate to characterize the distribution and migration of Site contamination. While the EPA data is adequate, the agency does recognize that further characterization of water quality conditions will be necessary for Remedial Design. The precise scope of the groundwater treatment system will be determined on the basis of further data obtained during the Remedial Design phase.

Comment b: Work Place Systems stated that Alternative MM-2 is not likely to remove ketones from the groundwater.

EPA's Response: Although the effectiveness of the proposed treatment system on ketones is limited, it is reasonable to expect that the system removal efficiency will be sufficient to meet the cleanup goals. The only ketone for which a target cleanup level has been established is 2-Butanone. The design influent concentration of 2-Butanone will be determined under pumping conditions during Remedial Design. The development of the clean-up goal for 2-Butanone is based on an EPA Health Advisory and as such is not a requirement, but rather a consideration. If during treatability studies, to be conducted during design, EPA determines that the goal of 172 parts per billion (ppb) cannot be obtained with the treatment system proposed, EPA will perform a risk analysis to see if the levels which can be obtained fall within the acceptable risk range (10^{-4} - 10^{-7}). If in order to fall within the acceptable risk range, additional treatment for 2-Butanone is still necessary, EPA will evaluate heating the groundwater influent. This has been shown to improve the efficiency of an air-stripper in removing 2-Butanone.

Comment c: Work Place Systems, Peter Johnson, the Town, and Canonie stated that it is unclear why flushing of the source areas is proposed when it is not recommended in the FS screening.

EPA's Response: The proposed remedy provided for returning a portion of the treated groundwater to the Solid Waste Landfill and to the section of the Tire Dump where the 1988 drum removal was performed. The intent was to try to flush contaminants from the soils to the groundwater where it would be collected and treated. This would be nothing more than accelerating the natural flushing which presently occurs. However, in consideration of comments received during the comment period, and upon further review of flushing techniques as applied to the Site, EPA agrees that the effectiveness of flushing contaminants at the Solid Waste Landfill is questionable, due to the types of materials located in the area, the proximity of the debris to bedrock and the difficulty in controlling leachate. Accordingly, flushing of contaminants at the Solid Waste Landfill has been eliminated from the selected remedy. Flushing is still considered a viable option at the Tire Dump, where none of the above concerns apply. However, based on the most recent groundwater sampling conducted by Canonie Environmental of Indiana, groundwater emanating from the Tire Dump meets drinking water standards. There is no longer a need to flush contaminates from the soils to aid in groundwater cleanup. Therefore, flushing of soils at the Tire Dump has also been eliminated.

Comment d: Sanders stated that the remedy proposed for the Site may not be effective and practical, and may even exacerbate existing conditions at the Site.

EPA's Response: EPA disagrees with this comment. The detailed evaluations of SC-2 and MM-2 presented in Section 4 of the FS demonstrate that these alternatives would be implementable using proven technology and would result in a remedy which is protective of public health and the environment.

The reference to "exacerbation" of existing conditions was specific to the proposed discharge of a portion of the treated groundwater onto the source areas. As discussed in response III.B.1.d, flushing of soils at this Site is no longer being considered. As a technical matter however, the adverse impact to which Sanders referred could only occur if flushing water were applied at a rate that caused contaminated groundwater from the source area to flow outside of the influence of the groundwater collection system. This will not occur if the collection system is properly designed, and if the recharge and collection process is properly operated.

Comment e: Xentex commented that due to a seriously deficient and fundamentally flawed Supplemental RI/FS, Xentex could not recommend a preferred alternative for either groundwater or soil contamination. And, that since the scientific and technical basis is inadequate, such a selection would be whimsical and arbitrary. They urged EPA to address the deficiencies before the Site ROD is signed.

EPA's Response: EPA disagrees with the statement that there are serious deficiencies or fundamental flaws in the Supplemental RI or the FS. Minor errors or omissions have been pointed out in the public comments, and these are addressed in this Responsiveness Summary. None of the errors or omissions significantly affects the characterization of site conditions presented in the Supplemental RI or the evaluation of alternatives presented in the FS. The Supplemental RI and the FS were performed in accordance with the latest EPA guidance (OSWER Directive 9355.3-01) and provide a sound basis for the selection of a remedy. Moreover, the most recent round of data obtained by Canonie on behalf of the PRP offering this comment, among other PRPs, further confirms the validity of the scientific and technical assumptions made in the RI/FS.

2. The Supplemental RI/FS

Comment a: Work Place Systems generally concurred with the report prepared by Canonie.

EPA's Response: No Response Required

Comment b: Work Place Systems, the Town, and Peter Johnson stated that the sampling data upon which much of the preferred alternative was based is unreliable and that field blanks were reported to be contaminated.

EPA's Response: The allegations that errors or anomalies exist with respect to the sampling data are unsubstantiated. There is a simple explanation as to why more analytes were detected in the latest round of analyses than in previous analyses.

In brief, most of the additional analytes "found" in the latest round of analyses were detected at very low levels, one part per billion (1 ppb) or less, and were flagged with a "J". The "J" indicates that the value is an estimate, since the analyte was detected below the Contract Required Detection Limit (CRDL) but above the Instrument Detection Limit (IDL). The analyte identification is not questionable in the least.

In the Contract Laboratory Program (CLP), there are approximately 100 laboratories that have been inspected by EPA and these are contracted to perform routine sample analyses for Superfund sites. Since there are so many laboratories in the CLP, standardized detection limits, i.e. the CRDLs, were developed. These CRDLs must be achieved by every instrument in every laboratory.

In addition, every instrument has a particular instrument detection limit (IDL) that is unique to that instrument and time period. That IDL must always be below the CRDL. Since each instrument has a different IDL (or low point), it is quite reasonable for the latest set of Auburn Road analyses to have more low level "contamination" detected than in the previous analyses . Values between the IDL and the CRDL are positive identifications of compounds; however, the quantitation of these values can only be estimated. These variances can account for insignificant differences between laboratories and between samples. The comparisons are therefore, invalid.

The allegations that "poor laboratory practices resulted in 'carry over' of high-level standards into the test samples," and also that "the blanks for the samples were similarly contaminated," are totally unfounded. The PRP's own consultant stated in her report that on the basis of the information she reviewed, "carry over" of high-level standards into the test samples could not be substantiated. The CLP analytical methods, quality control procedures and deliverables are the standards by which the rest of the environmental chemistry community is judged. Ms. Stewart's statement that "it is good lab policy to run a blank in any chamber which has had a standard greater than 50 ppb" is incorrect. The CLP methods do not require a blank to be run in each of those chambers, nor would standards with concentrations greater than 50 ppb be used in the CLP if there was concern with routine "carry over."

The laboratories awarded contracts by the CLP are required to have a rigorous in-house Quality Assurance/ Quality Control (QA/QC) program. They must also undergo periodic on-site evaluations by EPA and they are required to analyze Quarterly Blind Performance Evaluation samples four times a year to demonstrate acceptable performance. Even so, blank contamination exists in every laboratory and can arise from a multitude of sources. It is true that York Laboratory and NANCO had blanks containing several low level contaminants. Analytes potentially affected by blank contamination were flagged on Table D-1 with a "B" to alert the data user.

Comment c: Peter Johnson stated that the no-action alternative was not properly evaluated.

EPA's Response: The No Action alternatives for source control and management of migration were evaluated in accordance with the National Contingency Plan and EPA guidance on preparation of RI and FS. The propriety of EPA's evaluation of the MM-1, No Action, alternative is further discussed in response to Attachment B.3.i.

Comment d: Peter Johnson, the Town, Sanders, Canonie, and Xentex all commented that the Supplemental RI does not properly characterize groundwater at and around the Site and does not define the nature and extent of currently existing groundwater contamination.

EPA's Response: While EPA had characterized groundwater in a technically acceptable manner at the time when this comment was offered, EPA acknowledged the value of having further data in authorizing Canonie to perform additional groundwater sampling. EPA still recognizes that current site conditions will have to be further evaluated during Remedial Design. This will include another round of groundwater samples to characterize the current groundwater conditions as well as additional surface water and sediment samples.

Comment e: Canonie commented that the Supplemental RI/FS proposes remedial alternatives which are unsupported by Site investigations.

EPA's Response: EPA disagrees with this statement. The FS presents a range of remedial alternatives for Source Control and Management of Migration which were developed to address specific conditions on-site and off-site. The alternatives were evaluated in detail in conformance with the latest EPA FS guidance (OSWER Directive 9355.3-01). While Canonie evidently disagrees with the remedy selected, the substance of the comments presented by Canonie regarding the development and evaluation of remedial alternatives does not support a departure from the chosen remedy for the reasons specified below.

Canonie made numerous comments which suggested a basic lack of understanding of the Feasibility Study process:

o Canonie repeatedly presented assertions that design-level hydrogeologic investigations had not been performed, indicating that it failed to understand the distinction between FS and Remedial Design activities. The FS evaluates and compares alternatives conceptually. EPA requires that further hydrogeologic investigations will be necessary during Remedial Design.

o Canonie also questioned the "representative process options" for capping and physical/chemical treatment, indicating that it failed to understand the representative process option concept and the information presented in Figures 3-1 and 3-2 of the FS. As stated in "Guidance for Conducting RI/FS's under

CERCLA" (OSWER Directive 933.3-01):

> One representative process option is selected, if possible, for each technology type to simplify the subsequent development and evaluation of alternatives without limiting the flexibility during remedial design.

A clay cap as a source control alternative or oxidation/reduction as a management of migration alternative were not eliminated but were not chosen as "representatives" of a technology type.

o The underlying assumptions in the cost estimates for the Canonie alternatives differed so completely from those in the alternatives in the FS, and were so biased in favor of the Canonie alternatives, that no meaningful cost comparison could be made. Examples of this include:

- Canonie alternatives MM-4A and MM-5A were costed based on a 30 gallon per minute(gpm) flow rate operating at 24 hours per day. Alternative MM-2A in the FS was based on a flow rate of 100gpm operating for only 8 hours per day. However, the Canonie alternatives did not adjust the labor hours to account for the increased operation time.

- Canonie has not included any provision for removal of metals. Canonie's text states that treatment for metals removal is not necessary when UV/peroxide technology is used. Manufacturers of the equipment associated with this technology, however, recommend treatment to remove iron if iron concentration exceeds approximately 5 mg/l.

- Canonie neither included a cost for an on-site laboratory, nor increased costs to allow for off-site analysis. The on-site laboratory cost carried for Alternative MM-2 was $605,000. Similar groundwater treatment facilities at Superfund sites are required to conduct daily influent and effluent monitoring for indicator chemicals at a minimum. Canonie's cost estimates thus fail to provide for the implementation of this crucial method of determining plant efficiency and compliance with clean-up standards.

- The cost provided by Canonie for the treatability study is equal to 10% of the cost treatability study cost provided by Weston. This clearly indicates a different scope of "treatability study" than costed for the other alternatives.

  - The cost estimates of all of Canonie's alternatives are based on a labor force of one person working an eight hour shift, five days per week. Canonie's text, however states that the alternatives were costed based on a total of two full-time operators for the 30 gpm system and five full-time operators for the 250 gpm system. Neither the costs provided in Canonie's estimate nor those suggested in the text are adequate. In preparing EPA's cost estimates, Weston included continuous coverage by two people, the minimum allowable number of operators under OSHA, 29 CFR 1910.120(d)(2), 3/6/89, Final Rule, a regulation specifically cites any cleanup required by a government agency. Adjusting Canonie's estimates to be in compliance with OSHA would result in an overall increase to each of Canonie's alternatives of approximately $3,000,000, as each of the alternatives are specified as having 24 hour per day/7 days per week operation.

- Canonie's statement in the text that certain off-site monitoring activities should be eliminated would jeopardize the remedial goals of compliance with ARARs and protectiveness of human health and the environment. Limiting the scope of residential well monitoring and off-site surface or ground-water monitoring would prevent EPA from verifying protectiveness. Canonie's proposed MM alternatives would not meet OSHA ARARs. Canonie's alternatives also may not provide compliance with ARARs in the event that influent to the treatment system exceeds the arsenic MCL.

- Comments regarding pretreatment limitations and monitoring requirements assumed by EPA (for MM-3) imply that the terms and conditions of a discharge agreement should be negotiated at the FS stage prior to the selection of a remedy. The feasibility study must be based on conservative assumptions regarding these terms and conditions.

Comment f: Peter Johnson commented that the Supplemental RI/FS fails to properly consider or price the alternative of excavating and placing the existing landfills into a state-of-the-art cell with leachate collection systems.

EPA's Response: The excavation and on-site placement of wastes into a state-of-the-art cell with leachate collection systems was addressed in Chapter 3 of the FS report. This technology was developed into preliminary alternatives (PSC-9, PSC-10, and PSC-11) for each source area. Wastes excavated from the source areas would be tested and, for some of the waste, treatment would likely be required prior to placement.

As also noted in the FS text, the secure landfill process option was retained for combination with other process options into several of the site-encompassing Source Control alternatives. As such, Alternative SC-4 and SC-7 both include the complete cost of excavating and placing 240,000 cubic yards of material (the combined volume of the source areas) in a RCRA-type landfill. The cost of implementing only a landfill, with no allowance for the potential requirement of treatment prior to placement, would be approximately $18,000,000, as compared to a total of $7,500,000 for the chosen alternative, which is also protective of public health and the environment. This $7,500,000 includes all present worth operation and maintenance costs (groundwater monitoring, cap maintenance, etc.).

Mr. Johnson's comment also downplays the issue of air emissions from the source areas and suggests that compliance with standard health and safety provisions might be optional. On the contrary, EPA's cost estimate for all alternatives requiring excavation of source areas must include, and did consistently include, an allowance for air emissions controls, ambient air monitoring at site boundaries, and equipment and supplies to protect personnel from potential vapor emissions. Volatile organic chemicals, including several indicator chemicals, have been measured in ambient air at and near site boundaries. This data is presented in Chapter 7 and Appendix G of the NUS RI. The potential also exists for an unexpected release of contaminants uncovered during excavation, and EPA must be prepared to protect its workers, prevent emissions, and document that these controls were protective during these occurrences. In addition to potential emissions of toxic contaminants, the emission of objectionable malodorous organic gases is expected during excavation, and these emissions must be controlled to prevent creation of a public nuisance.

Comment g: The Canonie report observed that cost estimates for the various alternatives are not always consistent. In addition, the report notes that there is no explanation in the Supplemental FS as to why different factors are used to determine cost estimates for the various alternatives.

EPA's Response: Canonie correctly notes two minor inconsistencies in cost estimation contained in the FS report. Both errors occurred in the costing of MM-3. Specifics are discussed in Attachment B, of Canonie's comments. In response to these comments, the costs for MM-3 were recalculated and a new sensitivity analysis performed. The new costs are as follows:

	MM-3 Small system	MM-3A Large system
Capital Costs	$2,460,000	$4,030,000
Present Worth/O&M	4,750,000	12,100,000
Total Cost	7,210,000	16,100,000
50% Confidence Interval	$6 - 8.4 million	$13 - 18 million

As can be seen from a comparison of the above summary and the cost summary in the FS (ES-9), the overall cost of MM-3 increased approximately $100,000, while MM-3A decreased by approximately $100,000. A comparison of the numbers from the old and new sensitivity analyses show no significant differences in the costs.

In EPA's opinion, the minor errors which existed in the costing of MM-3 did not prejudice the process of choosing a preferred alternative. The new cost and sensitivity analysis tables (Attachment D, Tables II-3, II-3-A, IV-2 and IV-2-A) are attached.

Comment h: Sanders, Peter Johnson, and Canonie suggested that another source of contamination may exist off-site, to the north or northeast.

EPA's Response: The assertion that contamination at the NUS-1 and NUS-2 well clusters is the result of an off-site source is not corroborated by any of the previous studies performed at the Site. Groundwater and plume migration have generally been shown to be moving in a northerly direction. The migration of contaminants from either the maintenance shop or body shop at the Whispering Pines Trailer Park would have to proceed perpendicularly to the flow of groundwater. The leach fields at the trailer park are cross gradient and down gradient of the NUS off-site well clusters, minimizing the possibility that they might have caused the present contamination.

On the basis of EPA's investigation, which was revisited in light of these comments, EPA has determined that the possibility of significant sources of contamination other than the four identified source areas is unlikely. However, if any party has information or knowledge regarding the disposal of hazardous substances at the Site this information should be provided to EPA.

3. The Removal Action

Comment a: Peter Johnson stated that the barrel removal operation and its limitations must be factored into a full understanding of the Site.

EPA's Response: The "limitations" of the barrel removal were considered during preparation of the RI/FS and selection of a remedy. Specifically, Mr. Johnson's comments question the quantity of hazardous materials actually removed from the Site. It should be clearly understood that all material removed from the Site required disposal at a hazardous waste disposal facility. His assessment that only "low levels" of contaminants were found is incorrect. The composite sample from the seventeen drums identified as liquid oxidizers had levels of 2-butanone, an indicator chemical, approaching 25%. The quantity of 2-butanone in those seventeen drums could contaminate the water beneath the Town Dump to a concentration of greater than 70 parts per million (ppm), a value 400 times that of the clean up level. This does assume that all contamination is released at once; however, it is an illustration of what a "small" quantity of drums containing high levels of contaminants can do to a large quantity of groundwater.

EPA acknowledges that some of the drums removed from the Site were empty or contained solidified wastes. However, many of these drums contained hazardous substances and may have contained liquids. Soils left in the ground could also have been contaminated with leachable compounds. EPA recognized that, despite the source reduction accomplished through the removal of drums, remediation of residual soil contamination had to be evaluated. Therefore, the Source Control remedies evaluated for the Site included soil treatment and containment alternatives.

IV. REMAINING CONCERNS

Issues raised during the public comment period that will continue to be of concern as the Site moves into the RD/RA phase are described briefly below, along with EPA responses.

Comment a: Xentex stated that predesign studies are necessary to refine and reassess data from the RI and to develop design parameters for any remedy.

EPA's Response: EPA fully agrees with this comment. Prior to the final design of the selected alternative, studies will be undertaken to define the design parameters of the remedy with the necessary precision.

Comment b: Xentex requested that, should treatment of withdrawn groundwater be necessary, treatability testing should be conducted to determine treatment processes to be applied to recovered groundwater.

EPA's Response: Treatability testing of the process options presented in the proposed remedy (air stripping/carbon adsorption) will be accomplished during the pilot plant phase of the Remedial Design. The cost of this testing was included in the costing of each of the MM alternatives. If this testing should show a serious deficiency with a chosen process option, other process options would be evaluated for use at the Site.

ATTACHMENT A

COMMUNITY RELATIONS ACTIVITIES CONDUCTED AT THE AUBURN ROAD LANDFILL SUPERFUND SITE IN LONDONDERRY, NEW HAMPSHIRE

EPA has conducted the following community relations activities at the Auburn Road Landfill Superfund site:

- October 1984 - EPA prepared a Progress Report describing Superfund activities at the Site.
- May 1985 - EPA prepared a Community Relations Plan.
- October 1985 - EPA issued a report describing Progress and Plans at the Site.
- March 28, 1986 - EPA issued a Press Release announcing the barrel removal conducted by EPA as a removal action.
- April 1986 - EPA issued a Summary of the Remedial Investigation.
- April 30, 1986 - EPA held a Public Meeting to explain the results of the Remedial Investigation.
- July 1986 - EPA issued a Summary of the Focused Feasibility Study.
- July 24 - August 14, 1986 - EPA held a public comment period on the Focused Feasibility Study.
- July 30, 1986 - EPA held a Public Meeting to announce the results of the Focused Feasibility Study.
- August 6, 1986 - EPA held a Public Hearing to record public comments on the results of the Focused Feasibility Study.
- August 27, 1986 - EPA issued a Community Newsletter.
- September 17, 1986 - EPA issued a Press Release announcing plans to install a waterline to homes near the Site.
- October 7, 1986 - EPA issued a Community Newsletter.
- October 16, 1986 - EPA issued a Community Newsletter.

- October 22, 1986 - EPA issued a Community Newsletter.
- October 31, 1986 - EPA issued a letter to residents regarding a site tour and completion of the removal action.
- November 6, 1986 - EPA issued a Community Newsletter.
- November 24, 1986 - EPA issued a Press Release announcing the review of the Endangerment Assessment.
- February 23, 1987 - EPA issued a Press Release announcing the Administrative Order.
- September 23, 1988 - EPA issued a Press Release announcing a removal action at the Site.
- March 1989 - EPA prepared a Proposed Plan to describe the cleanup alternatives and the Preferred Alternative considered for the Site.
- March 17, 1989 - EPA issued a Press Release announcing the Public Meeting to explain the proposed cleanup plan for the Site.
- March 22, 1989 - EPA held a public meeting to discuss the proposed cleanup plan.
- March 22, 1989 - EPA issued a Press Release announcing an additional public meeting to discuss the proposed cleanup plan for the Auburn Road landfill site.
- March 30, 1989 - EPA held an additional public meeting to provide a second opportunity for the public to learn about EPA's preliminary recommendation for cleanup of the Site.
- March 23 - May 18, 1989 - EPA held a public comment period to provide an opportunity for public involvement on the final cleanup decision.
- April 17, 1989 - EPA issued a Press Release announcing the change in location for the public hearing.
- April 25, 1989 - EPA held a public hearing to record public comments on the proposed cleanup plan.
- April 25, 1989 - EPA issued a Press Release announcing the extension of the comment period.

ATTACHMENT B

DETAILED SUMMARY OF POTENTIALLY RESPONSIBLE PARTY COMMENTS

This attachment provides a detailed summary of PRP comments received by EPA during the public comment period. The comments are organized in the following categories: 1) EPA's Preferred MM Alternative; 2) EPA's Preferred SC Alternative; 3) The Supplemental RI/FS; 4) the Overall Preferred Remedy; 5) the Site Removal Action; and 6) Community Relations and the Public Comment Period.

1. EPA's Preferred MM Alternative

Comment a: Work Place Systems stated that the RI/FS does not provide data to support the placement and location of deep bedrock extraction wells, because it is not known whether such pumping would draw contaminants from the overburden and contaminated areas into the previously uncontaminated deep bedrock areas.

EPA's Response: EPA agrees with Work Place Systems that the location and depth of bedrock wells needs further refinement in the Remedial Design phase of the project. A depth of 300 feet was discussed in the FS based on contamination known to be present in bedrock wells greater than 200 feet in depth. Additionally, according to the NUS RI, significant fractures were found along the entire length of several of these 200-foot wells and significant water bearing fractures were found at depth. Therefore, the 300-foot depth was conceptually chosen to provide a conservative drilling cost estimate, representative of depths to achieve hydraulic control and capture of contaminants.

Based on data contained in the Remedial Action Assessment Investigation (RAAI), EPA acknowledges the possibility that bedrock contamination may be isolated in the top 15 to 20 feet of bedrock, in which case the well installation program will be modified accordingly. As noted these determinations will be made during Remedial Design.

Comment b: Work Place Systems stated that the overburden extraction wells proposed to the north of the solid waste landfill are not likely to extract the quantity of water indicated in the FS because of the limited saturated thickness and shallow depth to bedrock in this area.

EPA's Response: While it is true that the area immediately adjacent to the landfill has limited overburden saturated thickness and high bedrock, this is not where the overburden extraction wells are proposed to be located. As shown in Figure 4-18 of the FS, the conceptual groundwater collection system includes extraction wells placed approximately 300 feet north of the landfill. It may be advantageous to locate wells in weathered bedrock close to the landfill, but this will require confirmation during Remedial Design.

The yield of the overburden wells was estimated based on hydraulic conductivity measurements collected during the supplemental RI for wells in the area north of the Solid Waste Landfill. Calculations for conceptual design pumping rates from wells and trenches are provided in Appendix G of the FS.

The placement of the wells to the north of the landfill would not only facilitate increased pumping rates, due to the increased saturated thickness, but would also help to capture contaminated groundwater which has migrated to the north of the Solid Waste Landfill. The monitoring wells in the area of the proposed extraction wells contained elevated levels of several indicator chemicals during the 1987 sampling performed by Weston.

Comment c: Work Place Systems, the Town and Canonie noted that several of the primary contaminants at the Site are ketones (such as 2-butanone and acetone) and that EPA's Preferred Alternative MM-2 is not likely to remove them from the groundwater. The Canonie report suggested two other technologies as alternatives to treat ketones: 1) fixed bed biological reactors, and 2) ultraviolet light with ozone and/or hydrogen peroxide.

EPA's Response: As discussed in response to comment III.B.1.c, EPA is fully aware of the limitations of the air -stripping process with respect to removal of ketones, specifically 2-butanone. However, EPA expects the proposed process will be capable of attaining compliance with the target cleanup levels. In any event, the Record Of Decision specifically provides for the possibility that air stripping could be supplemented by other technologies, such as ultraviolet destruction, if necessary.

Comment d: Sanders, Canonie, and Xentex stated that when selecting the remedy, inadequate consideration was given to the following factors:

- aquifer thickness;
- contamination levels;
- groundwater flow patterns;
- groundwater extractability rates;

- bedrock permeability;
- hydraulic gradients; and
- groundwater mounding.

Overall, commentors commented that the subsurface environment has been inadequately defined and that additional groundwater samples should be collected.

EPA's Response: The extensive subsurface investigations performed at the Site provide sufficient information to support the interpretations of subsurface conditions presented in the RI, the Supplemental RI and the FS. The concept of "defining" the subsurface environment is misleading, since no level of investigation can provide absolute definition. Hydrogeologic investigations, by their very nature, rely heavily on interpretation of a finite amount of data and inference of site conditions between data points within the study area.

Of the seven factors listed in this comment, two factors (contamination levels and groundwater flow patterns) were considered and evaluated throughout the RI/FS process, as clearly indicated in the NUS RI, Supplemental RI and, the FS Report. The other five factors are primarily relevant to the evaluation of the No Action alternative (MM-1), and to the design of groundwater remediation alternatives (MM-2 and MM-3). Examples of tasks in which these five factors were considered will be presented here, in the order presented in the comment.

Aquifer thickness (saturated overburden thickness) was considered during interpretation of the subsurface flow regime, during development of conceptual groundwater interception and collection systems at the source areas, and during development of the conceptual groundwater collection and recharge programs. Aquifer thickness is depicted in the RI in subsurface profiles (Section 5 and Appendix C) and the overburden isopach (Figure 5-1). Thickness of saturated overburden at various collection trench and overburden extraction well locations is presented in the design calculation summary in Appendix G of the FS.

Groundwater extractability rates were considered during development of the capping alternatives (SC-2 and SC-3) and the groundwater collection and treatment alternatives (MM-2 and MM-3). The rates were estimated using the Theis equation. Hydraulic conductivities were based on pump test data (RI Section 5 and Appendix D), hydraulic test data (Supplemental RI Section 4 and Appendix F, and RI Section 5 and Appendix H), grain size analyses (RI Appendix G) and literature values for similar soils. The other inputs to the rate calculations were based on site-specific conditions and literature values, where appropriate. This level of consideration is adequate to support remedy selection and is not purported to be adequate for Remedial Design.

EPA interprets the term "bedrock permeability" in the comment to refer to yields of bedrock wells under pumping conditions. Bedrock well pump tests are not typically performed during an RI, but rather are a component of Remedial Design. Accordingly, bedrock aquifer testing has not yet been performed at the Site.

Hydraulic gradients were evaluated based on seven rounds of static water level measurements during the RI and the Supplemental RI. Groundwater contour mapping was performed based on each set of data. The conceptual groundwater interception and collection systems at the source areas, and the conceptual groundwater collection programs, were devised based on theoretical calculations of pumping rates necessary to control hydraulic gradients in areas of groundwater contamination (Feasibility Study Appendix G).

Vertical hydraulic gradients, indicating conditions of discharge to or recharge from overburden to bedrock systems, were evaluated and discussed in Section 5 of the RI. Vertical hydraulic gradients which influence the depth of contaminant migration in the overburden are discussed in the RI (Section 5) and the Supplemental RI (Section 4.2). The conceptual overburden extraction well locations were selected to intercept contaminants flowing at depth in the overburden, in the location of the bedrock trough depicted in the RI (Plate 4, Bedrock Contour Map, Appendix C Crosssection D-D', Figure 5-16, Inferred Toluene Contaminant Distribution, and Figure 5-17, Inferred Trans-1,2-dichloroethene Contaminant Distribution).

Comparison of hydraulic gradients between overburden wells and adjacent surface waters was performed during the RI and discussion of the significance of this information is presented in Section 6.

Groundwater mounding considerations are relevant to design of Alternative MM-2, wherein treated groundwater would be discharged back into groundwater. Groundwater mounding during discharge of water to the Solid Waste Landfill, as discussed in the Response to Comment III.B.1.e, is no longer a concern since soil flushing has been eliminated. Other groundwater discharge areas would be outside of the contaminated areas and recharged water would meet target cleanup levels. Thus, mounding would not jeopardize the effectiveness of the remedy.

With respect to the overall comment that further definition of the subsurface environment is needed and that further groundwater sampling should be performed, as noted earlier, EPA fully recognizes the need for more detailed information prior to the implementation of the remedy. Such information will be obtained during the Remedial Design.

Comment e: Sanders stated that the adverse impacts of the proposed MM Alternative have not been considered, and questioned why EPA would propose to treat groundwater that has already reached target cleanup levels at the risk of further or renewed environmental damage.

EPA's Response: EPA does not propose to treat groundwater which is already at or below target levels. Prior to the implementation of any groundwater recovery and treatment system, a comprehensive sampling program would be undertaken to assess current groundwater quality. The effectiveness of the remediation program would be assessed by periodic sampling of the monitoring wells at or near each source area. When groundwater at each source area achieves the cleanup levels, the use of that particular portion of the recovery system would be discontinued.

As currently designed, EPA anticipates no adverse impacts to the environment at the Site due to implementation of the proposed alternative. This would be confirmed during Remedial Design studies and, if necessary, modification to the proposed remedy would be made prior to Remedial Action.

Comment f: Sanders stated that the extent of bedrock aquifer contamination has not been documented and suggested that the effectiveness of groundwater treatment be demonstrated before proceeding with numerous bedrock wells, especially since bedrock aquifer cleanup has not been shown to be feasible in New England, in the past.

EPA's Response: The extent of bedrock contamination will be further evaluated in Remedial Design, as will the effectiveness of the groundwater treatment system. Cleanup of groundwater in bedrock may be facilitated on this site due to the preferential flow path associated with the bedrock trough which extends across the central portion of the Site.

Comment g: Sanders commented that the treatment of inorganic arsenic by metal hydroxide precipitation to a 50 parts per billion (ppb) level is probably not feasible.
EPA's Response: The effectiveness of arsenic removal, via

precipitation, will be evaluated during Remedial Design based on groundwater characteristics under pumping conditions. Removal of arsenic to 50 µg/l is feasible using the treatment system described in the FS. Chemical precipitation using lime has produced removal efficiencies ranging from 25 to 99% (EPA 600/2-82-0010). Based on the most recent groundwater sampling data in wells that have levels of arsenic which exceed the drinking water standards, the average concentration of arsenic is 126 ppb. At this average concentration, the precipation unit would need to remove only 60% of the arsenic to attain the MCL of 50 ppb.

Comment h: Sanders suggested that the feasibility of discharging groundwater to a municipal wastewater treatment plant should be considered since biological treatment would be effective on many of the remaining compounds of concern.

EPA's Response: As discussed previously, in Attachment B.1.a, discharge of groundwater to the Manchester WWTP would be viable under certain circumstances. Biological treatment would effectively remove certain of the indicator chemicals, particularly toluene and 2-butanone. The level of pretreatment required would be specified in the agreement or permit regulating this discharge. It would not be appropriate to assume that the agreement would allow discharge without pretreatment.

Comment i: the Town stated that performance of a groundwater treatment remedy based on target cleanup levels that might be met before the remedy is implemented, would conflict with the requirement in CERCLA, as amended by SARA, that remedies be cost-effective.

EPA's Response: EPA has no reason to believe that groundwater cleanup would occur naturally within two years, the time necessary to implement the Remedial Action. The selected remedy is cost effective because its cost is proportionate to what it accomplishes. None of the other alternatives evaluated achieve as high a degree of protectiveness for less money.

Comment j: the Town stated that EPA's preferred groundwater collection methods do not appear to have been designed with actual site conditions in mind.

EPA's Response: EPA disagrees with this comment. Information presented in Section 4.3.2 and Appendix G of the FS indicates clearly that hydrologic evaluation of site conditions formed the basis of the conceptual groundwater collection systems presented. Approximate locations of collection trenches and overburden extraction wells were based on consideration of site-specific soil types, hydraulic conductivities, saturated thickness, and other variables presented in the Appendix G engineering calculations. The yields calculated for these collection systems are representative and appropriate for conceptual cost estimation purposes. Final locations of extraction wells and trenches and extraction volumes will be determined during Remedial Design.

Comment k: Peter Johnson stated that any proposed treatment scheme must balance the time of constructing the treatment facility with the speed of the groundwater through the Site. Based on the speed figures in the Supplemental RI/FS, Peter Johnson observed that nearly all of the pollution on-site at the last round of sampling would have left the Site and would be more than a mile away by the expected beginning of actual groundwater treatment. Peter Johnson stated that, by the time any proposed treatment plan could be in effect, the data on which it is based would be 5 years old; and that it is foolish to design a treatment plant in 1989 based on 1987 facts for implementation in 1992. It was also stated that no analysis has been done as to where the contamination might actually be in 1992.

EPA's Response: EPA recognizes that groundwater quality conditions will have to be evaluated during Remedial Design. The statements made by Mr. Johnson with regard to contaminant transport are based on a gross oversimplification of the groundwater flow regime. The statement that groundwater treatment will be based on 5-year old data is incorrect. Groundwater conditions will be evaluated throughout Remedial Design and treatment on the basis of ongoing sampling.

Comment l: The Canonie report recommended that:

- surface water monitoring is not necessary at the Site;
- monitoring of residential wells to the west and northeast of the Site is not necessary; and
- that any off-site monitoring program should focus on volatile organic compounds.

EPA's Response: The proposed environmental monitoring program for the Site must insure that the proposed remedy is protective of public health and the environment.

Although limited studies to date have not indicated contamination in on-site streams and Whispering Pines Pond, contamination due to runoff is a possibility and therefore, monitoring is warranted. In addition, Cohas Brook is considered to be the ultimate receptor of overburden groundwater flow from the Site.

The monitoring parameters were determined based on the types of contaminants found in the on-site wells and the source areas. Chemicals representing all HSL categories (VOA, semivolatiles, pesticides, PCBs and metals) were found on-site. Although, as pointed out in many of the comments, many of these compounds are not very mobile, they can potentially be carried by the more mobile constituents.

Comment m: The Canonie report stated that there is no need for an active inorganic treatment system at the Site and that only those inorganic compounds that precipitate as a result of changes in groundwater chemistry in the treatment process should be removed.

EPA's Response: The inorganic treatment system would remove inorganic compounds which would otherwise clog the air stripping and carbon adsorption units. The FS report states that the treatment system would be optimized for arsenic removal. Arsenic was detected at concentrations exceeding the target level in several wells downgradient of source areas, as presented in the RI. Therefore, in keeping with FS guidance, treatment of arsenic was evaluated.

Comment n: Canonie suggested that extraction wells pumping at rates of 200 to 250 gallons per minute (gpm) would seem to exceed the amount of water available on the Site, and stated that further hydrogeologic studies be done on the Site.

EPA's Response: EPA agrees that a flow of 200 to 250 gpm may exceed the amount of water available on-site. A flow of 250 gallons per minute is only possible if the off-site wells north of Whispering Pines Pond and the wells at the north property boundary are included in the groundwater recovery system. The yields and drawdown curves for extraction wells placed in these areas were calculated using the Theis equation. Hydraulic conductivity data used as input was collected during the supplemental RI. Information obtained during a short term pumping test of the Whispering Pines Pond Well concurred with the calculated yield and zone of influence.

As shown in Appendix G of the FS, the extraction rate calculated for the wells and trenches surrounding the source areas is estimated at approximately 20 gpm.

EPA agrees that further hydrogeologic studies are necessary prior to the implementation of the Remedial Action. During Remedial Design, aquifer testing, including pump tests, will be performed.

Comment o: The Canonie report stated that in the cost estimate for Alternative MM-2, a total of 1,800 linear feet of extraction trench is proposed. In the cost estimate for Alternative MM-3, only 800 linear feet of trench is proposed. The text of the Supplemental FS (Weston, p. 4-147) indicates that the extraction system for Alternative MM-3 "would essentially be the same as that described for Alternative MM-2".

EPA's Response: Canonie is correct in pointing out that the collection trench in MM-3 should have the same length (1800 feet) as Alternative MM-2. The costs (and corresponding tables) for Alternatives MM-3 and MM-3A have been revised, and the tables are attached to this Responsiveness Summary. The difference in cost is insignificant compared to the overall cost of these alternatives and therefore would not affect EPA's choice of a remedial alternative.

Comment p: The Canonie report stated that, concerning the liquid phase activated carbon system, the text of the Supplemental FS states "The contactors would each contain 20,000 pounds of carbon, and would require replacement carbon cartridges every 4 months." (Weston, p. 4-140). This implies that liquid phase activated carbon usage would range between 60,000 and 120,000 pounds per year depending on the interpretation of "replacement carbon cartridges". This is inconsistent with the 37,400 pound per year carbon usage proposed in the cost estimate for Alternative MM-2 (Weston, Appendix D, Table II-2). This additional carbon usage would add between $463,000 and $926,000 to the present worth of Alternative MM-2 for the low flow (30 gpm) case. It is not clear from the Supplemental FS report whether this same omission of a substantial operation cost applies to the high flow (275 gpm) case of Alternative MM-2.

EPA's Response: The costs presented in Appendix D for activated carbon usage are the result of calculations using actual site conditions projected flow rates, and vendor information. The discussion of carbon usage presented in the text was meant to be descriptive and was not based on calculations. The operation and maintenance costs presented for activated carbon in Appendix D, Tables II-2 and II-2-A, are appropriate, and there is no "omission", as referred to in the comment.

Comment p: The Canonie report noted that summary costs presented (Weston, Appendix D, Table II-2) for Alternative MM-2 do not agree with the summary cost presented in the sensitivity analysis (Weston, Appendix D, Table IV-1). In particular, the detailed cost estimate presented early in Appendix D as Table II-2 states the cost for "Groundwater Recovery System" as $790,000 and for "PW O&M Cost" as $4,878,801. However, Weston used a cost of $365,000 for "Groundwater Recovery System" and a cost of $5,009,902 for "PW O&M Cost" in the sensitivity analysis. The values in the detailed cost estimate and sensitivity analysis for these items should be the same. Canonie stated that these inconsistencies render the sensitivity analysis of Alternative MM-2 useless. In addition to these inconsistencies, there is a second sensitivity analysis also identified as Table IV-1 (Weston, Appendix D, Table IV-1) which is wholly inconsistent with any of the detailed cost estimates presented in Appendix D of the Supplemental FS. This may be related to an alternative that was eliminated from further consideration during preparation of the Supplemental FS report.

EPA's Response: Canonie is correct in that Table IV-1 and Table II-2 of Appendix D do not agree. However, the numbers presented in the text for the sensitivity analysis of MM-2 (FS, Table 4-9, page 4-39) are based on the correct sensitivity analysis. A former version of Table IV-1 was mistakenly placed in Appendix D. A corrected version is attached to this document and will be included in the Administrative Record. Despite being slightly different from the corrected version, the version of Table IV-1 available to the public was still very useful in showing the variability of MM-2 to various stresses, as the upper and lower limits of the 50% confidence interval differed by no more than $200,000.

Comment q: The Canonie report stated that the capital cost estimates for Alternative MM-2 are based on a service cost factor equal to 90 percent of the value of installed equipment while the estimates for Alternative MM-3 are based on a service cost factor of 125 percent. There is no explanation in the Supplemental FS why different factors are used in the various alternatives.

EPA's Response: Canonie is correct that a different factor was used for services cost in MM-3 than in MM-2. The correct service cost factor should be 90% of the value of installed equipment as presented for Alternative MM-2. The costs for MM-3 have been recalculated and, as mentioned previously, corrected versions of the cost and sensitivity analysis tables are attached. The difference in cost is insignificant compared to the overall cost of the alternatives and in no way would have affected EPA's decision making process.

Comment r: The Canonie report stated that while the Supplemental FS estimates that it will cost $605,000 to establish an on-site laboratory, an on-site laboratory equipped with a GC/MS unit (a GC unit would be sufficient) would not cost more than $200,000.

EPA's Response: The cost of an on-site laboratory is based on vendor supplied information for a mobile laboratory with the necessary equipment for analysis of all indicator chemicals for the Site. EPA feels a GC/MS is necessary to accurately identify and quantify the indicator chemicals at the target cleanup levels. Performance of the analysis on-site would be more cost effective than off-site for all alternatives except No Action (MM-1 and SC-1), SC-6, and MM-3.

Comment s: The Canonie report noted that the Supplemental FS report projected activated carbon usage rates for the high flow (275 gpm) case of Alternative MM-2 to be eight times the carbon usage rates for the low flow (30 gpm) case of Alternative MM-2. This is roughly the ratio of total treatment system flow rate. The Supplemental FS report has failed to account for the fact that as the groundwater extraction system is extended to larger areas and the total extraction rate is increased, the concentrations of chemicals in the extracted water will decrease dramatically. These decreased concentrations will allow a greater treatment rate as expressed in gallons of water per pound of carbon and therefore, simply taking a ratio of flows is not an accurate method of predicting carbon usage for the high flow case.

EPA's Response: Canonie is correct in that the ratio of carbon usage per volume of water treated was calculated for the average characteristics of contaminated groundwater, and did not allow for dilution caused by pumping uncontaminated water. EPA also agrees that as the ground water extraction rate increases, the concentration of chemicals in the extracted groundwater may decrease allowing a greater treatment rate in terms of gallons of water per pound of carbon. However, chemical concentrations under pumping conditions cannot be determined until pump tests are conducted during Remedial Design. Therefore, estimating activated carbon usage based on groundwater flow is a good conservative estimate in the face of uncertainty which can only be clarified during Remedial Design.

Comment t: The Canonie report stated that on the comparison of Alternative MM-2 and Alternative MM-3, using a sensitivity analysis, the present worth cost is essentially the same because of the overlap of the cost ranges for the two alternatives (Weston, Supplemental FS, p. 4-165). This comparison does not account for the similarity of the two alternatives and the fact that the same permutations that will increase the cost of Alternative MM-2 will also increase the cost of Alternative MM-3. Therefore, costs associated with these two alternatives cannot be assumed to vary independently as is assumed in the random cost sensitivity analysis. Based on these cost estimates, Alternative MM-3 will always be less costly than Alternative MM-2.

EPA's Response: This comment is premised on a misconception of the inputs to the sensitivity analyses of MM-2 and MM-3. Although on the surface, it appears from the sensitivity analysis tables that similar cost items were varied for these alternatives, one must look at what comprises each of the "similar" cost groupings. For instance, a variable evaluated in both analyses was equipment and supplies cost. However, a review of cost components for each alternative shows that MM-2 has the cost of carbon units ($288,000) whereas MM-3 does not (assuming carbon treatment would not be required). The cost of extension of a sewer to the Site could vary considerably depending on the design requirements. This would also cause the cost of MM-3 to vary independently from MM-2. The sewer use fee included as part of the O&M cost ($400,000 present worth) could also be significantly different from what was estimated in the FS; it might be set higher or lower depending on the terms and conditions of the discharge agreement. In summary, there are several expensive items which differ between MM-2 and MM-3 which would cause the alternatives to vary independently of one another. EPA expects each alternative could vary within the 50% confidence interval range presented in the FS.

Comment u: Sanders, the Town, and Xentex stated that analytical data suggests that concentrations of inorganics (including arsenic and lead) in the groundwater are generally below target levels and that such levels as do exist, result from natural background levels. Because of this situation, treatment for inorganics is not required under SARA, would be inconsistent with the cost-effectiveness requirements, and would not be in accordance with law.

EPA's Response: Although it is true that the average of all samples analyzed for arsenic is less than the cleanup goals, six out of the 17 samples collected were above the cleanup goal of 50 parts per billion (ppb) for arsenic. The majority of these wells exceeding the cleanup goal are within the area defined as the "Central Plume" by Weston. One cannot simply use an average of the whole Site to determine if cleanup is in fact necessary. Compliance with target cleanup levels must be attained at the established compliance boundary. It is EPA's intent to clean up separate areas of the Site and, as individual wells attain the target cleanup levels, discontinue pumping from those wells.

The statement by commenters that the levels of arsenic observed above target levels represent "background" conditions is not supported by the data. Eleven out of the seventeen wells sampled contained arsenic concentrations below the cleanup goal. In fact, four of the samples had no detectable arsenic.

2. EPA's Preferred SC Alternative

Comment a: Sanders, Work Place Systems, the Town, Peter Johnson, and Canonie questioned why EPA proposed soil flushing as part of the overall cleanup remedy when the FS does not recommend it because it would exacerbate contamination of the aquifer. Work Place Systems stated that flushing may be ineffective because water will tend to leach out of the sides rather than downwards through the wastes. Sanders questioned why EPA proposes to flush soil when target levels have already been met, especially at the risk of further or renewed environmental damage, and why the adverse impacts of this remedy have not been considered. the Town stated that the FS itself confirms that a decision to implement this part of the remedy would be arbitrary, capricious, and inconsistent with the National Contingency Plan. Peter Johnson stated that soil flushing cannot be accomplished with limited on-site groundwater; threatens to destabilize previously stable landfill areas; assumes that Mr. Johnson would permit the pumping of off-site chemicals onto his land for treatment; and would not likely meet with success since it is an unproven technology and the column leachate test was ineffective under laboratory conditions.

EPA's Response: Previous responses III.B.1.d and III.B.1.e also address the topic of discharge of a portion of the treated groundwater onto the source areas. As explained in response III.B.1.d, this practice should not be confused with soil flushing which has been eliminated from the remedy.

Sanders' comment with regard to compliance with target levels is addressed in responses Attachments B.1.f and B.3.b.

The statement that the column leachate test was "ineffective under laboratory conditions" is incorrect. In fact, the column test demonstrated that contaminants present in soil from the source areas were leachable using simulated rain water.

The primary limitation of the tests was that the samples obtained did not contain some of the volatile organic compounds listed as indicator chemicals for the Site. The data obtained therefore could not support contaminant transport calculations for the indicator chemicals, as originally intended. The tests did provide useful information about the leaching characteristics of some of the contaminants present at the Site, including certain indicator chemicals. These observations are reported in the Supplemental RI.

Comment b: Xentex stated that EPA's source control alternative of a multi-layered cap would not provide any reduction of infiltration of precipitation into the source areas because, after several years of uncontrolled infiltration, the concentrations of contaminants leaching from the wastes are expected to approach a practically irreducible concentration. But, stated Xentex, a cleanup benefit could be achieved if the source areas are covered with a simple soil cover at the beginning of the remedial action phase.

EPA's Response: The proposed method of closing the landfills with a simple soil cover would not comply with the relative and appropriate requirements of RCRA part 264 or State closure requirements. The implication that the NHDES would approve of such a method of closure for other similar landfills is without basis. The construction of a multi-layered cap, as proposed by EPA, is a proven technology for reducing infiltration of rain water.

Comment c: The Canonie report noted that placing collection trenches around the perimeter of the solid waste landfill will be ineffective and that infiltration, which is the only transport mechanism of importance, can be effectively controlled by additions to or repair of existing caps.

EPA's Response: The groundwater collection trenches around the Solid Waste Landfill and extraction wells were designed to capture infiltration, groundwater beneath the landfill, and groundwater which had migrated beyond the source boundaries. As depicted in Figure 4-18 of the FS, the trench along the eastern side of the landfill is discontinued in areas where overburden thickness is not sufficient.

EPA agrees that infiltration is an important transport mechanism, but horizontal groundwater flow beneath and around the Solid Waste Landfill can not be dismissed. Based on interpretation of test pit observations, topography and groundwater elevation data, the overburden beneath the solid waste is saturated. In some locations, solid waste is in direct contact with groundwater.

The comment also suggests that the partial cover in place at the Solid Waste Landfill could be converted to an effective cap. This comment is addressed in response to Attachment B.3.o. below.

3. The Supplemental RI/FS

Comment a: Work Place Systems, Sanders, and Peter Johnson stated that the sampling data upon which much of the remedy was based is outdated, unreliable, has QA/QC problems, and no correlation of the data can be made with respect to the Site. Peter Johnson stated that no important decisions should be based upon this data and no valid conclusions can be drawn from it. Sanders suggested updating the Site data base with a groundwater contaminant analysis, and Peter Johnson suggested a new round of samples with appropriate safeguards.

EPA's Response: Although the data used by EPA in preparing the Supplemental RI and FS was obtained in 1987, EPA does not agree that the data is unreliable or had QA/QC problems. From before the issuance of the proposed plan, EPA has recognized that further sampling data must be obtained prior to the implementation of the remedy, so that the design of the groundwater treatment system is appropriate to current site conditions. In addition, in July of this year, EPA entered into a Consent Order with (11) PRPs which authorized the collection of a complete round of groundwater samples. Sampling and analysis was performed by Canonie Environmental under contract to the PRPs. A report of the sampling results was presented to EPA on August 14, 1989. The data contained in the Canonie Report indicates that the average concentration of groundwater contamination across the Site has decreased since EPA's last sampling round, but that unacceptable levels of contaminants still exist in the groundwater and that the treatment conceptually envisioned by EPA is still appropriate and necessary.

As to the reliability of EPA's data and the sufficiency of EPA's QA/QC procedures, Canonie's assertion that significant amounts of compounds not previously found at the Site were found in the trip and field blanks collected by Weston in 1987 is completely unsubstantiated. Of the eight VOCs identified in Weston blanks, all were found at or below the CRDL and all but two compounds (tetrachloroethene and toluene, each found in one sample) were flagged with a "B" qualifier indicating laboratory and not field or trip blank contamination. All of the compounds detected were also found in at least one on-site well. Two semivolatile organics (di-n-octyl phthalate and benzo(a)pyrene) were found in trip or field blanks. Various phthalates were also found in many on-site samples. Benzo(a)pyrene was not found in any other groundwater samples. Neither of these compounds are indicator chemicals. Various metals were found in the blanks, including the indicator chemicals arsenic and lead. The levels found were between the CRDL and the IDL.

Although levels of indicator chemicals not attributable to laboratory contamination were found in trip blanks collected by Weston, all but one compound (tetrachloroethene) was found at levels much lower than the target levels. The level of PCE found is very close to the target level, but since other samples showed the presence of this compound at levels up to ten times the target level, it should not be presumed that the bottles or distilled water used during the sampling event somehow contributed to false positive readings. Further more, only one organic compound, benzo(a)pyrene was found in only one field blank collected by Weston. This established that field QA/QC procedures such as decontamination were followed and that cross contamination of samples did not occur.

Canonie's assertion that field methods were not included in the Supplemental RI indicates a less than thorough reading of the report. Sampling methodologies, including preservation and preparation methods, are included in Appendix A. As stated in this appendix, groundwater samples collected for metal analysis were field filtered prior to shipment to the CLP laboratory.

Comment b: Sanders, Canonie, and Xentex stated that the information in the RI indicates that most of the contaminants in the Site groundwater may have already reached prescribed target levels and that natural attenuation may be occurring, thereby obviating the need for aquifer remediation. Xentex suggested an additional round of sampling to determine if a trend toward improvement is occurring.

EPA's Response: The various commenters are correct in noting that the RI discusses a decreasing trend of indicator chemicals. However, trends do not suggest that the contaminant levels would have decreased to below target cleanup levels in the last two years since sampling and in fact, groundwater data presented in the Canonie Report indicate that target cleanup levels have not been met. See also the discussion of the No Action alternative for Management of Migration in Section 4.3.1 of the FS.

Prior to the implementation of the Remedial Action, in the Remedial Design phase, another sampling effort will be conducted to assess current site conditions. EPA does not intend to pump and treat groundwater which has achieved cleanup levels.

Comment c: Sanders, Peter Johnson, Canonie, and Xentex commented that the RI report contains a technically insufficient amount of data to indicate the existence of a plume of contaminated groundwater, that data does not show a correlation between off-site contaminants and those occurring on-site, and that, because there were few monitoring wells or test results from the postulated location of the alleged plume, these few data points do not provide enough information to indicate a plume. Sanders. suggested that the plume be defined and, if possible, the sources of contamination be identified.

EPA's Response: EPA disagrees with the comment that data is insufficient to indicate the existence of a plume of contaminated groundwater. EPA has shown, via water quality data acquired during three rounds of sampling of the numerous monitoring wells, a strong correlation between the waste disposal source areas and the plumes. EPA believes that the data collected by Canonie Environmental also supports this correlation.

The large number of contaminants detected in the Town Dump area soil and groundwater is indicative of the complex nature of this source. Multiple rounds of samples consistently indicate the presence of contaminants associated with this source both beneath the source and in wells north of Whispering Pines Pond. EPA's latest round of samples (1987) confirms the interpretation of deep contamination movement downslope of the bedrock surface in the area north of Whispering Pines Pond, as depicted in the cross-sections in Figures 5-16 and 5-17 of the RI. The cross-sections indicate that the contaminants moving in the deep overburden and shallow bedrock may converge with the central plume in the bedrock trough downgradient of the Site.

The central plume associated with the Solid Waste Landfill is supported by groundwater contours, groundwater quality data, and subsurface information. The bedrock trough between the source and the contaminated wells GZ-9 and NUS-1 apparently acts to confine the plume. The soil characteristics would also be expected to limit dispersion transverse to the direction of bulk groundwater flow. EPA notes that the direction of groundwater flow from the Solid Waste Landfill toward GZ-9 and NUS-1 is not in dispute, based on the contours and plumes presented by Canonie. The only question is whether the contaminants detected at GZ-1 continue to flow downgradient or, for some reason, become attenuated in the soils in the vicinity of GZ-1.

Comment d: Sanders, Peter Johnson, and Canonie commented that there are a significant number of contaminants off-site (on the north side of Whispering Pines Pond), which have never been found in six years of on-site sampling. Sanders suggested that there is evidence to support the concern that other sources may be contributing to groundwater contamination. Peter Johnson requested an explanation for this situation and noted that no serious effort has been made to determine the quality of groundwater flowing from the trailer park area and that no soil samples have been taken to assess whether this property is a potential source area.

EPA's Response: The contention that the trailer park is a source of contamination is discussed and dismissed in the response to Comment B.2.h in Section III. An examination of the groundwater data collected by Weston in 1987 shows no evidence of volatiles, pesticides, PCBs or metals in off-site wells which were not present in on-site wells or soil samples. The presence of compounds in Weston's sampling round which were not found in previous studies is discussed in the response to Comment III.B.2.b.

Comment e: the Town stated that the Supplemental RI does not include the analysis of source area data which, they said, is a necessary prerequisite to accurate decisions about tailoring a remedial alternative to each source area.

EPA's Response: EPA disagrees that the Supplemental RI did not include an analysis of source area data. Summaries of groundwater and soil data for each source area are contained in Chapter 4 of the Supplemental RI. Additionally this data is summarized in Chapter 1 of the FS (Tables 1-1 through 1-20 and Figure 1-7). Source areas were considered individually in Section 3.2 of the FS where representative process options were combined into preliminary alternatives for Source Control of each source area.

Comment f: the Town said that any choice of a preferred alternative based on the inadequate and outdated information contained in the RI would be arbitrary and capricious under CERCLA, as amended, and inconsistent with the National Contingency Plan, as amended.

EPA's Response: EPA disagrees with the statement that the information contained in the RI is inadequate and outdated. The data is adequate to describe the Site conditions and to demonstrate that source areas have resulted in degradation of groundwater quality at site boundaries, and off-site, with contaminants exceeding ARARs. The evaluation of the No Action alternative for Management of Migration concludes that these conditions will continue for decades without active groundwater remediation. Thus, the argument that the three rounds of groundwater data collected over the last five years are "outdated" is unpersuasive and the suggestion that the remedy is arbitrary is contradicted by the facts.

Comment g: Peter Johnson stated that the groundwater elevation, direction of flow, and rate of flow have never been properly and consistently determined, and that no consistent and organized data exists which would allow for the necessary understanding of the Site hydraulic characteristics.

EPA's Response: EPA disagrees with this comment. Interpretation of water level data acquired by the EPA, and confirmed by Canonie, has consistently shown that groundwater flows in a generally south to north direction, that is, from the source areas towards the Whispering Pines supply wells, Whispering Pines Pond and Cohas Brook. EPA has assessed flow rates on the Site by means of a pump test and by slug testing of monitoring wells on the Site. Both the RI/FS and the supplemental RI/FS addressed groundwater flow. Flow rates are consistent and within anticipated values expected for the strata tested.

Comment h: Peter Johnson stated that the Supplemental RI/FS fails to properly consider or price the solution desired by most abutters: excavating and placing the existing site landfills into an on-site state-of-the-art cell with leachate collection systems. Peter Johnson stated that, in the absence of undue EPA regulatory requirements such as air-monitoring, this could be accomplished at a cost less than the preferred alternative. Peter Johnson stated that, moreover, this could be accomplished without endangering the environment or displacing abutters. Moreover, a lined landfill, which is greatly needed in the area, would be created.

EPA's Response: The excavation and placement into a containment cell of all source area material without treatment is discussed in the response to comment B.2.f of Section III.

Comment i: Peter Johnson and Xentex commented that the no-action alternative for groundwater contamination was not properly evaluated; specifically, that the evaluation failed to address groundwater near the source areas separately from groundwater to the north of Whispering Pines Pond.

EPA's Response: As stated previously, the No Action MM Alternative was evaluated in accordance with applicable guidance. An overall No Action MM Alternative (MM-1) was chosen as the No Action alternative required for evaluation by CERCLA. As it is EPA's interpretation that the on-site and off-site groundwater belong to the same flow regime and that the chemicals found in the off-site wells are there because of on-site activities, there was no reason to evaluate on-site and off-site No Action alternatives separately. Additionally, No Action to off-site water is included in the evaluation of the other MM Alternatives. Both MM-2 and MM-3 were evaluated and costed based on two separate scenarios, pumping only on-site water and pumping on-site and off-site water.

Comment j: Peter Johnson and Canonie observed that Table D-1 reveals anomalies; specifically, that contaminants which had never appeared on-site in six years of testing suddenly, in 1987, appeared in high concentrations in off-site wells north of Whispering Pines Pond. Peter Johnson stated that it is gross professional negligence not to have sought confirmation of unusual results and to have failed to examine the original test records as complied in the CLP package.

EPA's Response: The first point of this comment, that contaminants which had never appeared on-site suddenly appeared off-site in high concentrations, is incorrect for two reasons. First, as discussed in the response to comment B.3.d, only one compound detected in off-site wells, 4-nitroaniline, was never detected on-site. This compound is not considered an indicator chemical for the Site, was not present in a concentration exceeding a chemical-specific ARAR and is not subject to a target cleanup level, thus its presence has no impact on the remedy selection process. Second, the compounds detected in "high" concentrations in off-site wells are the same compounds which have been consistently detected on-site throughout the years of groundwater monitoring at the Site, namely 2-butanone, toluene, trans-1,2-dichloroethylene, 1,2-dichloroethane and trichloroethylene.

The second point of the comment regarding the authors' responsibility to confirm the "unusual results" is based on the invalid presumption that the results were unusual. Furthermore, the data was developed under CLP program quality assurance and quality control procedures at an approved laboratory, and the data package had been independently reviewed by qualified chemists prior to being presented to the authors. The confirmation of results and examination of original test records compiled in the CLP package had therefore already been performed by qualified professionals prior to the use of the data. The authors followed the usual and customary practice of relying on the expertise of other professionals to provide quality data in support of the authors' task of preparing the Supplemental RI and the FS. Further discussion of the laboratory data is presented in response to comments III.B.1.b and B.3.a.

Comment k: Peter Johnson stated that, according to the report of Ms. Nancy Stewart, the CLP work done by York Laboratory of Connecticut was all done on one day on one single machine and that poor laboratory practices resulted in the carry over of contaminants onto the test samples and the blanks for the samples. Ms. Stewart's report indicated that the lab analyst did not clean the autosampler chambers because the test records themselves show that there was insufficient time to do so. Blanks were not run in the individual chambers which had been utilized to run the Standard analysis.

EPA's Response: Response to this comment was presented in Section III.B.2.b.

Comment l: Peter Johnson reported that a review of the test results from Nanco Labs indicated that methylene chloride and acetone were found in most of its samples and that a review of the method blanks proved that there was a laboratory contamination problem with these two contaminants. The trip blanks and field blanks associated with NUS 10 and NUS 12 show the highest levels of contamination.

EPA's Response: EPA fully agrees that methylene chloride and acetone were found to be laboratory contaminants in the samples analyzed at Nanco Labs. In fact, these compounds are common laboratory contaminants. Weston, in writing the FS, understood this and factored it into the assessment of the Site. This was especially significant in the case of methylene chloride, which was classified by PRC as an indicator chemical at the Site, based on previous site data but was only reported with the laboratory blank contamination qualifier in the most recent sampling program. If collected by the groundwater recovery system, methylene chloride would be treatable using the representative process options presented in the FS. The presence or absence of methylene chloride in the influent to the groundwater treatment system would not affect the choice of treatment technology or the capital or operation and maintenance cost of that treatment system.

Comment m: Peter Johnson and Canonie recommended that the property to the north of the landfill site be examined to determine if another source of contamination exists on the Whispering Pines property, because the test results from wells on the Whispering Pines site are far higher than the test results for wells actually on the Auburn Road Landfill site. Canonie and Peter Johnson postulated that there is a second source of pollution coming from the north or northeast of the Site.

EPA's Response: As previously stated in response to comment B.3.d of Section III, while data does support the presence of four waste disposal source areas and associated plumes, data does not support the contention of an off-site source. The water quality data in the Supplemental RI shows contaminant levels at higher concentrations downgradient of the Site, which is the logical result of multiple discrete releases of contaminants occurring over time, such as might originate from buried, leaking drums. The removal of drums from the Site should have stopped the majority of these releases.

Comment n: Peter Johnson stated that, for the analysis of groundwater contamination to be correct, one must assume that:

- a massive slug of contamination left the three disposal areas between 1980 and 1985, travelling in perfect laminar flow toward the wells on the north of the pond;

- contamination does not decrease as the distance from the source increases;

- slower moving contaminants must have been released first and the faster moving contaminants released later; and

- contaminants from more distant sources would have to have been released before more nearby contaminant sources.

EPA's Response: Mr. Johnson's assumptions oversimplify transport and fate of contaminants in the subsurface environment. There is no reason to expect each contaminant to be more concentrated in wells near the Auburn Road source areas than in wells remote from the sources. This might be expected for a particular contaminant if the source would continuously release the contaminant at a constant rate. For this Site, however, this is an unrealistic assumption. The contaminant distribution observed at the Site is typical for a site in which numerous discrete releases, as from barrels containing a wide variety of chemicals, occurred over an extended period of time.

The reference to "laminar flow" is apparently a reference to the shape of the central plume of volatile organic contaminants, as presented in Figure 1-7 of the FS. This shape is interpreted as the result of confinement of the plume by a bedrock trough, and of the low transverse dispersivity in the sandy soils within the area of the plume. "Laminar flow" is not necessarily a requisite for this observation.

The references by Mr. Johnson to a "massive slug of contamination leaving the disposal area between 1980 and 1985", and other references to the timing of releases of contaminants by no means describe the necessary conditions for the observed contaminant distribution at the Site. As stated earlier, discrete releases from multiple sources could account for the Site contaminant profile currently mapped.

Comment O: Canonie stated that the Supplemental RI/FS implies that the current caps on disposal areas are deficient and fails to assess the sufficiency of the cover material over each disposal area with regard to ARARs. Canonie stated that the assumption of cap deficiency is unsupported by site data and would result in the implementation of a remedial alternative not justified by public health or environmental concerns.

EPA's Response: EPA evaluated the existing "caps" on the disposal areas during the RI/FS process, and determined they had serious deficiencies. The present cover, where it exists, is thin and improperly graded. There is no evidence of cover material which would be considered impervious, and there has been no serious attempt to establish a vegetative cover. Section 4.2.2 of the FS provides a description of the improvements which would be required.

The cap design described in the FS would be appropriate for closure of a RCRA landfill, would be likely to obtain NHDES approval for appropriate closure of a municipal/industrial waste landfill, and is representative of good engineering practice. The cap design is conservative, particularly with regard to the 30" drainage layer above the impervious layer. It is conceivable that a drainage layer of as little as 18" may obtain approval, but this would certainly not be a conservative approach.

With regard to the issue of obtaining material from on-site to construct the new cap, it would not be appropriate for EPA to presume on-site material could be obtained at no cost. EPA estimated that as much as 50,000 cubic yards may potentially be available. In preparing the cost estimate, the unit cost for subbase construction (intermediate cover), including materials and grading, is $4.00 per yard. This cost reflects the possibility that some of the 50,000 cubic yards of intermediate cover could be obtained at a reduced cost, for instance through use of on-site materials.

The basis for selection of a composite cap (with an HDPE liner) as the representative process option is presented in the FS. The final selection of materials for construction is a Remedial Design function, in accordance with the RI/FS guidance.

Comment D: Canonie said that the Supplemental RI/FS stated that the drum removal is at least partially responsible for the declining concentrations of chemical constituents in groundwater, but that there is no evidence in the report which correlates analysis of excavated drums with contaminants in groundwater.

EPA's Response: A "correlation" between those constituents found in the drums and those found in the soil and/or groundwater cannot be expected. Many of the drums removed were empty, indicating that unidentified chemicals had been released. The likelihood also exists that liquid wastes or solid wastes with leachable constituents were disposed of directly on the ground in the source areas. Nevertheless, EPA is certain that the wastes removed from the Site decreased the magnitude of the source. EPA is confident that the removal is at least partially responsible for lower concentrations of indicator compounds in soil and groundwater. Data from the composites samples of material shipped off-site for disposal during the drum removal confirms that the following indicator chemicals were present:

Volatile Organics:
- Methylene Chloride
- 1,2-trans-Dichloroethene
- Trichloroethene
- Tetrachloroethene
- Toluene
- 2-Butanone

Semivolatile Organics:
- Benzo(b)fluoranthene
- bis(2-ethylhexyl)phthalate
- Fluoranthene
- PCBs

Metals:
- Cadmium
- Lead

Although these analyses were not performed by a CLP laboratory, the data is considered useful for the purpose of indicating the presence or absence of a given compound in the samples. The fact that some of the indicator chemicals were not found in the composite samples does not necessarily mean they are not present as a source at the Site and were not contained in some of the barrels which were removed from the Site.

Comment q: Xentex stated that it is not clear why pretreatment would be required for discharge of pumped groundwater to a sewer, with treatment at a publically-owned treatment works (POTW). Specifically, Xentex commented that the design of the proposed systems seems unreasonable, complex, and expensive.

EPA's Response: As stated in previous responses, discharge to the Manchester WWTP would be subject to the terms of an agreement and/or permit with the discharge limitations being determined on a case by case basis. In developing the cost estimate for MM-3, it was reasonably assumed that pretreatment to remove volatile organics would be a minimal requirement of this agreement. Treatment to remove iron and manganese would be required prior to the volatile organics removal unit operation. The resulting treatment system is not considered unreasonable or overly complex given these conditions.

Comment r: Xentex stated that the geophysical surveys for plume definition did not usefully identify conductive plumes, but relied heavily upon the water-quality data for the geophysical interpretation of plume definition. Conversely the ground-water quality sampling results relied heavily upon the geophysical for plume definition. The characterizations of the water-quality and geophysical data were reviewed separately and are not adequately conclusive. When combined, these evaluations also do not provide a reasonable level of confidence concerning plume definitions to indicate the presence of contaminants.

EPA's Response: The preponderance of data demonstrates the presence of multiple plumes on the Site. The use of all available data (i.e., geophysical and water quality data), in a complementary manner, is necessary to develop a valid interpretation of subsurface conditions. Groundwater quality and geophysical data are generally mutually supportive of the contaminant distribution presented in the RI. No one investigative technique was relied upon to draw conclusions. Rather, the characteristics of Site conditions were concluded based upon multiple studies over time using a variety of techniques.

Comment s: Xentex commented that the models developed for the RI are inconclusive and that serious deficiencies are noted for each of the models. The data obtained from the models cannot be viewed with any degree of confidence or as a decision-making tool.

EPA's Response: This response will address Xentex comments regarding modeling efforts described in the Supplemental RI and the FS.

I. ROCEM Model

The contaminant transport modeling performed by Weston for the Supplemental RI employed the "ROCEM" model. This model was developed by EPA in 1985 for use in evaluating the relationship between soil contamination and potential, resultant downgradient groundwater contamination.

Xentex correctly points out that the ROCEM model does not simulate contaminant transport at the Site along actual groundwater flow paths, predict the distribution of contaminants within the aquifer at the Site, or represent continuous contaminant influx at the various source areas. However, as stated in the Supplemental RI; "the purpose of the modeling effort was to provide quantitative estimates of the potential maximum levels of contaminants that can be expected in groundwater at downgradient compliance boundaries." As such, the ROCEM model was intended not to simulate present site conditions, but rather, to assess the relative groundwater contamination potential associated with the reported levels of residual soil contamination found in the three source areas. As originally developed by the EPA, the ROCEM model was intended to provide a reasonable, worst-case scenario of the groundwater contamination potential of a waste site.

Accordingly, the model is based upon several conservative assumptions. The additional text provided in Appendix G of the Supplemental RI provides an overview of diffusion/dispersion phenomena, and model development, and clearly highlights the limitations inherent in this simple analytical model.

Xentex correctly suggest that the model results "are not appropriate for the design of the remedial alternative." The results of the model were not used for this purpose. The results were among the factors considered when evaluating the No Action alternative, and were not supportive of implementation of this alternative.

II. Javendel Model

In general, the comments made by Xentex regarding the use of the Javendel Model in the FS address semantic discrepancies in the FS text. Xentex also suggests that some of the selected input values may be varied to yield different model results. Certainly the input parameters may be varied and indeed they were, and different results obtained. However, the effort conducted by Weston was undertaken to yield conservative, yet realistic results. Conservative values of input parameters, where appropriate, were utilized (e.g. retardation factor of "1", simulating maximum transport and minimum retardation of contaminants).

The results of the effort were considered unrealistic. A lack of information about the source areas, specifically dumping history, hampered attempts to obtain realistic results from the model. Therefore, the application of the model was limited to the evaluation of the No Action alternatives. The results of the model were not used as a decision making tool for the design of a groundwater remedial system, contrary to what Xentex suggests.

In response to specific points made by Xentex:

1) The model requires an assumed "input year", at which time the source begins to release contaminants. Weston used the last year that each source area was known to have been in use as the "starting date" of contamination input in the model. The input describing the source is not representative, since numerous *independent* releases would have occurred throughout the active life of each source area, and failure of waste containers could have resulted in discrete release events after landfill activity ceased. Clearly, as stated in the FS, input of one "starting date" would not be descriptive of the sources at the Auburn Road landfill.

2) The model input used by Weston was conservative with respect to the decay constant and the retardation and biodegradation of contaminants.

3) The model inputs which did not allow solute decay or retardation, and which provided a limited depiction of the source (see comment (1) above), resulted in the "frontal wave" observed. A similar phenomenon was not observed at the Site.

4) The values used were applicable to the plume migration pathway inferred for individual source areas. The dispersivity values selected for use in the model were based on literature references (Walton, 1984) and were compatible with hydrogeologic values measured at each source area.

5) Weston defined variables used in the equations as follows:

   R = retardation factor of the solute = 1
   = radioactive decay constant or decay constant of the solute = 0
   α = decay constant of the source
   = $0.15\ yr^{-1}$ for the Tire Dump and Solid Waste Landfill
   = $0.30\ yr^{-1}$ for the Town Dump

   The decay constant of the solute was used to simulate degradation of the solute or contamination. The decay constant of the source was used to simulate "decay" of the source.

6) The quote referenced does not refer specifically to the retardation factor in Weston's report but was taken out of context. We agree that the retardation factor does

not influence the maximum concentration and the report did not state otherwise.

III. Leaching Model

Xentex requested that the equations used for the leachate model in Appendix A of the FS be presented. The following is a step-by-step presentation of the actual method used, including all assumptions and units:

1. Estimate initial mass of given contaminant in the source:
   Assumption: Contaminant is uniformly distributed at average level found in test pit samples.

$$M_{si} = C_{si} * T_{mass} * \frac{kg}{10^{9}\,\mu g}$$

Where: M_{si} = initial mass of contaminant in source, g
C_{si} = initial concentration of contaminant in source, µg/kg
T_{mass} = total mass of source area, g

2. Estimate K_D, the source material/water partitioning ratio:
   By Definition:

$$K_D = k_{oc} * f_{oc}$$

Where: k_{oc} = organic carbon/water partitioning coefficient, ml/g
f_{oc} = fraction organic carbon, dimensionless

3. Estimate leachate concentration, C_L (µg/l):
   Assumption: Water and source material attain equilibrium

$$C_L = C_s * \frac{1}{K_D}$$

4. Estimate mass of contaminant leached per year, M_L (g/yr):
Assumption: Specific gravity of leachate is equal to unity.

$$M_L = C_L * I * A * \frac{1g}{cm^3} * \frac{1}{10^6 \mu g}$$

Where: I = infiltration rate of rain water, cm/yr
A = Area of source area, cm^2

5. Estimate soil concentration after year of infiltration, C_{si+1}, (µg/kg)

$$C_{si+1} = (M_{si} - M_L) * \frac{1}{T_{mass}} * \frac{10^9 \mu g}{kg}$$

6. Repeat Steps 3, 4, and 5 for as many years as required for the model application for each contaminant. Total organic mass and/or concentration can then be plotted.

Comment t: Xentex asked why benzene was not identified as an indicator parameter in the EA, and why the FS fails to address why benzene was added as an indicator compound after it was eliminated from the EA.

EPA's Response: As explained in Chapter 4 of the Endangerment Assessment, benzene was not chosen as an indicator compound because, during the NUS RI, benzene was found in only one soil sample and eight of the 60 groundwater samples at relatively low concentrations (approximately 12 ppb or less. During preparation of the Supplemental RI, benzene was detected in 19 of the 51 groundwater samples taken as concentration ranging from 0.2 to 43 ppb. Because of the increased number of occurrences and the higher concentrations detected, EPA decided to include benzene as an indicator compound.

Comment u: Xentex observed that it was not possible to re-evaluate the groundwater target cleanup levels since two crucial tables (FS, Appendix A, Tables A-1 and A-2) were omitted from the Site Administration Record.

EPA's Response: Xentex noted that Tables A-1 and A-2 were not included in the FS. This was acknowledged by EPA, and the tables were distributed and placed in the Administrative Record during the public comment period.

Comment v: Xentex observed that if the groundwater extraction system impacts low-lying areas which are classified as wetlands under New Hampshire law, compliance with New Hampshire Wetland Board, RSA 483-A and RSA 149-8A would be required.

EPA's Response: EPA agrees with this comment.

Comment w: Xentex commented that the public health risk values presented in the Weston supplement to the Endangerment Assessment conducted by PRC are misleading, poorly documented, and do not follow EPA guidance. Both the risk ratios and the carcinogenic risk may be over-estimated. It is necessary for the risk ratios and carcinogenic risk to be recalculated. Further, it is unfortunate that inadequate explanation and documentation in the supplement make this critical portion of the EA difficult to evaluate for its adequacy and use in the FS.

EPA's Response: This comment summarized pages 41 through 45 of the comments presented by Xentex. Several important misstatements were included on these pages:

- The Weston calculations presented in Appendix B of the FS are intended to supplement the EA prepared by PRC, and not to replace Section 8, as stated by Xentex. The calculations presented are not intended to be an independent endangerment assessment.

- The calculations performed by Weston to determine noncarcinogenic risk ratio and incremental carcinogenic risk conform to the methodology specified by the Superfund Public Health Manual. The Manual suggests that in certain cases it may be appropriate to divide chemicals into groups according to toxicological end-point, however, this additional effort is not typically requested or performed.

- The equations used to calculate the noncarcinogenic risk ratio and incremental carcinogenic risk are presented on each Lotus 123 spread sheet presented in Appendix B of the FS.

- Xentex incorrectly assumes that the groundwater and cleanup levels are strictly risk based. In fact, none of the levels are based on calculations presented in Appendix B of the FS. The reference for each of the target cleanup levels is provided in Table 2-6 of the FS. The calculations in Appendix B were performed as part of an evaluation of the adequacy of the target cleanup levels.

- Xentex states that "the post-cleanup risk ratios and cancer risks are too high, because they include compounds which have not been identified in groundwater". This statement is incorrect. The compounds in question are indicator chemicals and, as such, are included in the Appendix B tables. Since the compounds have not been detected in groundwater, and are not expected to be present in groundwater, no groundwater target cleanup level was established. The cleanup level reported in the tables is "NA" for each of these compounds, and the calculation of risk ratio and cancer risk did not include these compounds.

- Xentex states that, based on its comments, it is necessary to recalculate the noncarcinogenic risk ratios and the carcinogenic risk. The values were recalculated for all scenarios presented in Appendix B of the FS, in order to determine whether the changes recommended by Xentex would result in a change in calculated risk which affect the remedy selection process. The recalculated carcinogenic risks were all within one order of magnitude of the risks reported in Appendix B. Therefore, Xentex's recommended changes to the risk calculation would have no bearing on the remedy selection process.

In addition to the above major comments, the Xentex report also presented other minor comments.

- EPA acknowledges that fluoranthene is not typically considered carcinogenic. This compound was removed from the carcinogenic risk calculations prior to recalulation.

- The use of a "relative potency factor" for various PAHs is not currently recognized by EPA.

- The cleanup level presented for lead is 50 ug/L, not 50 MG/L as stated by Xentex. The basis for the cleanup level is the MCL for lead, as stated in Table 2-6 of the FS.

- The cleanup level presented in Appendix B for diethylhexyl phthalate was not adapted by EPA for the Site was therefore dropped from the table prior to the recalculation described above.

Comment x: Xentex requested that the alternative of off-site treatment of groundwater via a sewer to the POTW be considered in further detail. Administrative requirements that would be imposed on discharge to the sewer by the municipalities of the Town and Manchester, and by the State of New Hampshire should be determined. Limitations on chemical parameters of the discharge must be determined in order to assess the need for pretreatment; these limitations must be consistent with all other users of the POTW and also consistent with New Hampshire regulations. The costs presented in the FS for the POTW alternative have been grossly exaggerated due to the inclusion of an extensive treatment system.

EPA's Response: Alternative MM-3 was evaluated to the extent necessary under the Feasibility Study process. Administrative requirements and pretreatment limitations were assumed without filing permit applications on behalf of the PRPs and entering into permit and agreement negotiations. In the event a discharge to the Manchester WWTP is selected, the pretreatment limitations would not be determined by EPA. The issue of consistency of limitations with regard to other dischargers of contaminated groundwater to the Manchester WWTP or other New Hampshire POTWs must be addressed with the permitting agencies.

The costs presented in the FS for MM-3 and MM-3A have not been exaggerated, as suggested by the comment. Explanation of the basis for the treatment system is presented in Section 4.3.3 of the FS and discussed in previous sections of this document.

Comment y: Xentex stated that the possible applicability of a no-action MM remedial action which approaches a "no-action under CERCLA" alternative must be considered in further detail. This alternative should include the SC measures of capping of the landfills in accordance with state regulated capping requirements for municipal landfills, which would be required if the Site had not been listed on the NPL. In addition, the no-action alternative should include a routine groundwater monitoring program to evaluate groundwater flow and quality conditions upgradient and downgradient of the landfills. The monitoring program in this case would serve as an on-going detection monitoring program and would be used to identify future groundwater quality both upgradient and downgradient of the landfills.

EPA's Response: The so called "no-action under CERCLA" alternative that Xentex proposes is for all intents and purposes the same as SC-2, the chosen Source Control alternative in combination with the implementation of a No

Action MM Alternative. The no-action alternative for the management of migration alternative, (MM-1), does not address contamination currently in the groundwater or which may continue to be released from the source areas. EPA has determined that active restoration of the groundwater is appropriate for this Site. As discussed in Section X-B of the Record Of Decision, EPA considered its Ground Water Protection Strategy and the Agency's draft Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites in reaching its decision on groundwater remediation.

Comment z: Canonie questioned the approach of sampling and analysis of groundwater at the Site. In particular, they questioned why wells located in the "central plume" (A-30, GZ-3, GZ-6 and MW-9) were not sampled during remedial investigation. They also saw no objective to the analysis plan for the wells.

EPA's Response: The sampling and analysis plan for the supplemental RI was designed to obtain a representative view of the Site, with limited available funds. Well A-30, originally slated to be included, was found to be damaged. Again, with the analysis plan, only a limited number of each parameter were allowed; therefore, a representative distribution was selected. As the groundwater monitoring performed during the supplemental RI was a confirmatory study, the standard parameters previously analyzed were used again.

4. The Overall Preferred Remedy

Comment a: Sanders suggested that, on the basis of the sampling results, EPA prescribe a remedy which will effectuate further contaminant reductions.

EPA's Response: EPA believes that the remedy proposed in the Record Of Decision will effectuate further contaminant reductions.

Comment b: the Town said that the choice of a remedy based on the FS and not tailored to the principal contaminants at the Site would be arbitrary, capricious, and inconsistent with the National Contingency Plan.

EPA's Response: Refer to Atachment B.1.k.

Comment c: Peter Johnson stated that, to the extent the public has spoken, the public has found the preferred remedy inappropriate.

EPA's Response: While it is true that, for the most part, the public (i.e. local residents and potentially responsible parties) has expressed concerns that EPA's proposed remedy is inappropriate, the reasons for those concerns are quite different. Local residents do not feel EPA is going far enough with its clean-up efforts, while potentially responsible parties feel EPA is proposing a clean-up effort which is too extensive. In choosing a clean-up remedy, EPA must evaluate nine specific criteria which include community acceptance. Ultimately, however, EPA must choose what it believes is a remedy which is protective of public health and the environment and cost-effective.

5. The Site Removal Action

Comment a: Peter Johnson commented that EPA has consistently attempted to mislead the public as to the amount of hazardous material removed from the Site, by stressing the large number of barrels discovered at the Site, when little hazardous waste was found and air monitoring indicated no measurable increase in contaminant levels.

EPA's Response: Mr. Johnson's perception that EPA has attempted to mislead the public regarding the amount of hazardous material removed from the Site is understandable, given Mr. Johnson's status as a potentially responsible party, but it is inaccurate. During the removal operations, EPA issued weekly newsletters informing the public of the removal activities which were occuring. Newsletters were also issued to the public as materials were shipped to various disposal facilities.

Although each barrel excavated was sampled, individual samples were not analyzed, as the cost of this analysis would be prohibitive. Rather, all samples were mixed or composited and the composite samples analyzed. Results of the composite analyses showed the presence of hazardous substances. This may not be the procedure Mr. Johnson would have followed. He was asked to perform each of the barrel removal operations, however, and declined both times.

Comment b: Peter Johnson stated that abutters to the Site do not believe that EPA has found all of the barrels of waste on the Site.

EPA's Response: Refer to Response c in Section III.A.3.

Comment c: Peter Johnson stated that over 95% of the material removed from the Site was non-hazardous, non-regulated solid waste, and that this is what would be found in an old landfill and left there. Peter Johnson calculated that less than 40 gallons of actual undiluted hazardous material was removed from the Site.

EPA's Response: Mr. Johnson's comment that over 95% of the material removed from the Site during the 1986 removal action was non-hazardous, non-regulated solid waste is correct with respect to the manner in which the material was shipped off-site. The term "Non-Hazardous, Non-Regulated Waste" is from the shipping manifests and refers to designations used for Department of Transportation purposes. This material did contain hazardous substances. Based on the 1986 manifests, 704,080 pounds of material designated Non-Hazardous, Non-Regulated Solid Waste was removed from the Site. In addition, 8,860 pounds of PCB waste, 21,400 pounds of Hazardous Solid Waste, and 3,560 gallons of Liquid Hazardous Waste was removed from the Site. Mr. Johnson's calculation that less than 40 gallons of actual undiluted hazardous material was removed from the Site is unexplained. However, 40 gallons of undiluted waste could conceivably contaminate as much as 20,000,000,000 gallons of groundwater so as to exceed EPA's clean-up goals.

Comment d: Peter Johnson suggested that it is appropriate for the agency to tell the public the truth as to the small amounts of contamination uncovered and removed from the Site. And, that it is unfair to solicit comments based on intentionally misleading information distributed by EPA.

EPA's Response: EPA has attempted to keep the public aware of the seriousness of conditions at the Site. Although the amount of material removed from the Site, as stated in the above response, may be small to Mr. Johnson, it is a substantial figure to EPA.

6. Community Relations and the Public Comment Period

Comment a: the Town and Canonie would like to meet with the State of New Hampshire and EPA to discuss further activities and comments of the PRPs, and to facilitate such a meeting, renew their prior request for a 60-day extension of the public comment period.

EPA's Response: On June 21, 1989, the PRPs were permitted to present their comments orally to EPA. This responsiveness summary takes into account all the PRPs' written and oral comments. Regarding the PRPs' request for a 60-day extension to the public comment period, EPA evaluated the PRPs' request when it was first submitted and determined that a 60-day time extension was unreasonable in light of the original 35-day comment period allotted. EPA did, however, agree to extend the comment period by 14 days. The revised comment period ended on May 18, 1989.

Comment b: Peter Johnson stated that the failure on the part of the public to attend the final public comment hearing is indicative of the frustration the public feels towards EPA's performance at the Site.

EPA's Response: EPA disagrees with Mr. Johnson's observation that the failure on the part of the public to attend the final public hearing is indicative of the frustration the public feels towards EPA's performance at the Site. The two informational meetings held prior to the public hearing were each attended by 30 to 40 people. As explained during the informational meeting, the public hearing is only a forum at which people who wanted to comment on the RI/FS or EPA's proposed plan could do so and the comments would become part of this Responsiveness Summary. The lack of attendance at the public hearing only means there were few people who wished to express oral comments.

ATTACHMENT C

TRANSCRIPT OF THE APRIL 25, 1989 INFORMAL PUBLIC HEARING

UNITED STATES OF AMERICA

ENVIRONMENTAL PROTECTION AGENCY

BOSTON REGION

In the Matter of:

AUBURN ROAD SUPERFUND SITE

Londonderry Middle School
Mammoth Road
Londonderry, New Hampshire

Tuesday
April 25, 1989

The above-entitled hearing came on for hearing pursuant to Notice at 7:40 p.m.

BEFORE: CHESTER JANOWSKI, Chairman
Remedial Project Manager
Environmental Protection Agency
J.F.K. Federal Building
Boston, Massachusetts, 02203

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P R O C E E D I N G S

(7:40 p.m.)

MR. HUEBNER: I'd like to thank you all for coming this evening. My name is Dennis Huebner. I'm the Chief of the New Hampshire and Rhode Island Waste Management Branch in EPA in Region One.

My staff and I are responsible for the implementation of the Superfund program at the federal level, both in the states of New Hampshire and Rhode Island.

With me tonight, and they're going to serve on the panel for this hearing that's going to be conducted very shortly, is Chet Janowski.

Chet is the site manager for EPA on the project. To his left is Art Cunningham. Art is the consultant. He is from the firm of Roy F. Weston Engineers. To his left is Dan Coughlin. Dan is the section chief of the New Hampshire section.

Dan is the person that does all the Superfund work in the State of New Hampshire supervisor in EPA. To his left is Richard Pease. Richard is from the New Hampshire Department of Environmental Services.

The purpose of this meeting or hearing tonight is to formally accept your comments on the

Auburn Road Remedial Investigation and Feasibility Study, which is also referred to as the Auburn Road RIFS, and the proposed plan.

To date EPA has conducted two public informational meetings on the RIFS and the proposed plan. The first one was held on Wednesday, March 22, 1989, the second one on Thursday, March 30, 1989, in which we presented the information in the RIFS and the proposed plan to you and spent a fair amount of time responding to questions and comments that were raised by you in the audience.

The public comment period began on March 31, 1989. On April 12th and 13th, last week, EPA received two requests to extend the public comment period an additional 60 days.

EPA, in writing this past week, agreed to extend the public comment period an additional two weeks.

I believe that there is a press release over here on the table for those of you who wish to pick up a copy of that indicating what I verbally have just told you.

The revised comment period will now run from March 31, 1989, to May 15, 1989. That will consist of a total of 49 days.

Before beginning, I would like to describe to you the format for the hearing. Essentially, the evening is going to be structured as follows:

The first thing I'm going to do is ask Chet Janowski, who's the EPA site manager, to stand up here, and what he's going to do is present a summary of the proposed plan to you.

Following his presentation, we will accept any oral comments you may wish to make for the record. Those of you wishing to comment should have already indicated your desire to do so by filling out the cards that are on this table to my right.

If you haven't already done so -- is there anybody else -- so far, we've got three people that have indicated a desire to comment, offer some oral comments.

Is there anybody else that has decided to do so right now? If you have, raise your hand, and we will make sure you get a card.

Okay. I'm going to call on those of you wishing to make a statement in general in the order in which you signed up.

When I call upon you, I ask you to come to the front of the room. We have a microphone set up here. Comment directly into the microphone.

I also thought about, anticipating a larger group, that we try to limit the comments to 15 minutes each. I don't think that is going to be necessary. I would only ask that you take into account that I was originally considering a 15 minute period.

I was going to ask you to summarize if you felt that you had to go longer than the 15 minute period of time. I don't really think that's necessary to limit you at all this evening.

The text, in the entirety, is going to be transcribed. There's a Court Reporter that's here this evening. It will become part of the hearing record.

Following your comment, I or another member of the panel that are up here, are going to have the opportunity to ask you some questions, if we desire to do so, to further clarify something that you have stated.

After all the comments have been heard, I'll close the hearing. If you wish to submit additional written comments, and I encourage you to do so, these must be postmarked no later than May 18, 1999, and mailed to our office in Boston.

The appropriate address can be found on the proposed plan. It's on Page 2. We've got copies of the proposed plan over here on the table. Make sure that you know what the correct mailing address is.

At the conclusion of the hearing, please see any of the EPA representatives here tonight if you have any questions on the process for making comments.

All oral comments we receive tonight, and those we receiving in writing during the comment period, will be responded to in a responsiveness summary which EPA is required to prepare.

The summary will be included with the decision document which we refer to as a record of decision that EPA prepares at the conclusion of the comment period.

Does anybody have any questions about the format that we're going to use to conduct the hearing this evening?

(No response.)

MR. HUEBNER: Okay. Chet, would you please give a summary of the proposed plan?

MR. JANOWSKI: Thank you, Dennis. I'll briefly go over EPA's proposed plan. I know most of you have -- if not all of you, have come to at least one of the public meetings we've had previously.

Can everybody see this and hear me? Okay. Just to acquaint everybody, this is Auburn Road and Whispering Pines Ponds. This is the site. We've designated this as the town dump area. This is the tire dump area. This is the solid waste area.

What EPA is proposing is, basically, a two-phased approach. The first phase will consist of groundwater extraction and groundwater treatment.

What that will consist of is installing a number of extraction wells. These will be wells -- what we call well -- an overburdened well and a bedrock well associated with each one.

These will go in at the downgrading end, downgrading side, of each of the source areas. The groundwater flow is moving in this direction towards Cohas Brook which is out here.

So these wells will go in. In addition, there will be extraction wells put in generally along here which is about the property boundary line, and then to get off site migration, some additional wells will be put in on the north side of the Whispering Pines Pond.

In addition to those extraction wells,

there will be some trenches installed in the tire dump area -- I mean the town dump area and the solid waste area to collect the shallow groundwater flow coming off each of the source areas.

Groundwater from these areas will be pumped, and we've estimated a flow rate of about 250 gallons per minute, to a treatment facility located generally in the center of the site down here.

This treatment facility is going to consist of metal precipitation, air stripping where the volatile organic compounds, which are contaminating the groundwater, would be taken out of the -- out of the water, moved into an air stream, collected.

That air stream will be passed through activated carbon where it would be cleaned up, and then the air would be discharged back to the atmosphere.

The groundwater coming off of the air stripper will then, if needed, if additional treatment is needed, will be discharged again to an activated carbon unit for further cleaning.

The intent here is to get groundwater -- the groundwater cleaned up to a degree where it meets drinking water quality.

The groundwater, once it comes out of the carbon units, will be discharged primarily back within recharge trenches located on site in these locations here.

A small portion of that groundwater is intended to be used to flush out contaminants here in the tire dump and then again here in the solid waste area.

This will be -- this, being the larger area, will be a leach field type arrangement.

The estimated time for clean-up for this groundwater was estimated at somewhere between six to ten years, at a cost of approximately 17 million dollars. That cost includes all costs to construct the facility and to operate it for that ten year period.

The whole intent of that groundwater clean-up is to hold back the groundwater contaminated plume which is migrated off site, take the contaminated groundwater which is on site, clean it up so that at this point, along the property boundary, as the water moves off, the groundwater moves off, at this point it now meets drinking water quality.

Once that is attained, the second phase will be implemented, and what that will consist of is installing a multi-layer cap over each of the three source areas.

When we get to the tire dump, those tires that you now see would be shredded, put in the site and a cap placed over that.

There is a small waste mound next to the -- up here. That would be moved over onto the solid waste are and consolidated with that, and then that entire area would be capped.

What that cap will consist of -- it's a multi-layered cap. There will be a cover layer put over the site just basically to level it off, fill in any holes or pot holes that are contained on the site now, followed by a sand layer as a sub-base for a synthetic cap.

The synthetic material would be placed down. There would be a drainage net placed over that to collect any drainage coming down from the top of the cap that would be redirected along the plains of the synthetic cap, itself, to drainage trenches and carried off.

That, again, would be -- would be just clear drain water as it came down. Above the synthetic cap in the drainage layer would be a sand fill layer which is basically put there to protect -- protect the cap, and on top of that would be a loamed area that would support vegetation.

The [illegible] would be seeded to help -- to help improve infiltration down through here so that we don't have any bad runoff problems.

That -- again, that would be -- that cap would be installed once the groundwater clean-up has taken place. The estimated cost for that is seven and a half million dollars, so the total cost that we're talking about is somewhere in the vicinity of 24 million dollars for both phases.

MR. HUEBNER: Okay. Thank you, Chet. We're now going to begin to start receiving comments from the audience, and, in general, I'm going in the order that people signed up.

The first person is William Stearns, III.

MR. STEARNS: Good evening. I think -- I wasn't prepared to make a statement this early into this evening's program.

I guess I'm a resident of Auburn Road. I live next to the former town landfill that's indicated on the map.

I do have some comments tonight. I hope they're not to reflect on any individuals that are in this room representing the various state and federal agencies.

However, my opinion is I can't concur with what's being proposed here this evening. There are a number of reasons why.

I think I'll just keep it to what I feel are probably the more significant reasons. I think, first, I've had a long time to review all the history of this site dating back to 1979, all the way through until this evening.

What I've reviewed is not included in public documents that have been available at the town library, but also the numerous news articles that were published on this site and the various statements that were made over the years by various public officials on both the local level, the state level and the federal level.

Consistently, with all these statements that were quoted, they've underestimated the size and the scope of the problem at this site.

Starting back with Tom Sweeney's quotes, back in the early part -- latter part of 1979, where he was quoted in the newspapers as saying that barrels contain no hazardous waste, just a rubbery-like substance. We know today that's absolutely wrong.

Statements were made I think around October of 1983 by EPA officials stating that there was no real major problem there, other than there was some groundwater contamination problems. Today we know that's not the fact, that there were some major problems with the amount of hazardous waste that was in there.

Back in April of '85, the residents were told, when they were going to do the excavation of the barrels, that there would be between 300 and 500 barrels taken out. They've, at least, taken out approximately 2,400 barrels.

So it's a little hard for me to accept the fact that I've been told today that we feel we've gotten the majority of the barrels out of there.

I don't believe you've taken the majority of the barrels out of the solid waste landfill area. Common sense would tell you that you've indicated that the highest -- the plume that has the highest concentration of hazardous waste is the one that's emitted from the solid waste landfill, but yet you took the least number of barrels out of that area so I just -- I don't see where the least number of barrels that you took out of a particular area, and the plume emitting from that area, has the highest concentration of hazardous waste.

The two of them just don't make sense considering the fact that you took 1,200 barrels out of the old town landfill.

The proposed method for cleaning the groundwater is assuming that you do have the barrels out of the ground.

Now, I took pictures of the barrels as they were being excavated from the tire dump when they were doing that work, and the quality of some of those barrels that were coming out of the ground were in pretty good condition so if you've still got barrels in the ground anywhere in there, in either the solid waste landfill or the tire dump, then what you do over the next ten years is not going to guarantee that those barrels haven't deteriorated and that the hazardous waste has been emitted to the groundwaters supply.

If it hasn't, you may go through this whole process and then 15 or 20 years from now, you may have those barrels rupture, and you're going to start the process all over again with the groundwater being contaminated.

I guess the question is who would be responsible for the cleanup of the groundwater at that site, the state or the federal government?

The other part of this problem is I don't agree with what's being proposed for dealing with each of the areas.

You're proposing to put a cap over each area. To me, that's kind of the equivalent of sweeping dust under the rug.

It's frustrating to see that you've -- you say under the new guidelines that if you do excavate the soil there, you have to treat the soil, and that's what is driving the cost from, let's say, 18 million dollars to do excavation and containment and double-lined landfill to 30 or 40 million dollars, but if you go back to the history of the site, the town had received a preliminary feasibility study from GZA back on April 25, 1985, so that's four years to the day, indicating what its options were.

One of them did include to do excavation and containment. Now, under the old EPA guidelines that were in force at that time, prior to the reauthorization act of 1986, I believe that would have been an acceptable method.

But now under the new guidelines, that's not an acceptable method, and [illegible] are to [illegible] this treatment of the soil which is driving the cost again back up to 30, 40, 50 million dollars.

I cannot see this as being a method which is going to clean up the problems there. Granted, shipping the waste off site is exorbitant, and I believe it's unnecessary, but at the same time, what's being proposed here is at the other end of the spectrum which doesn't go far enough to permanently solve the problems on site.

My personal viewpoint is that the excavation and containment of the soil is what needs to be done and that the PRP should pay for that.

Now, if the soils have to be treated, then it's my opinion the EPA should have to pay for that because had negotiations been done a little bit better in the history of this site back in 1984, the town may have well been able to have continued with its feasibility study that it was doing with GZA at the time, and that clean-up option could have been exercised under the old Superfund acts, and it cannot be at this time.

The problem I see out of all of this which is you can have a study process go on for ten or 15 years and the game rules are being changed by the Congress every five or six years and who has to pay for the problem at that point?

I mean for the individuals or the congressman or the environmentalists who think that they got a better deal with these new Superfund laws that were enacted in '86. I've come to the sad conclusion that those new laws -- the only thing they've done is they've allowed two spectrums, either high cost, financially unacceptable clean-ups or a low cost option which really doesn't solve the problem.

I think realistically for a lot of these sites in the country the only realistic way to handle these sites is going to be do excavation, containment and double-lined landfill.

Treating these soils is probably never going to be a realistic option, at least probably in our lifetimes.

I don't believe what is going to be proposed here tonight is going to adequately handle the problem over the long term because of these issues that I've brought up tonight.

I feel that what you are proposing here, if you do go ahead with it, puts me in the position of what am I going to do with my property.

I'm, essentially, going to have a hazardous waste dump abutting my property which is going to be essentially in an uncontained state where mitigation of contaminants can come onto my property, and what do I do about that when I approach either a buyer, a seller or what do I do when I go to a bank and ask for mortgage lending?

I've had a lot of time to research that -- those issues, and what I'm getting right now from the various institutions is not a very good answer.

So, essentially, you're going to leave me with a problem which is no longer a short term problem which is what was quoted to us, I think, back in the hearings we had in '88, but is a permanent long term problem for me to deal with, and given the Statute of Limitations on New Hampshire laws, it would appear the only choices I'm going to have for me to consider at this point is to take legal action against the PRP's because I only have a six year time frame in which to take that action because if you do go ahead with this action, do the clean-up, and you don't cap that site for ten years or better, I've got a piece of property that more than likely I'm not going to be able to do anything [illegible] because of [illegible]

Although it's not the problem of the EPA to deal with the economic impacts of an area, you only have to deal with the health and safety of the environment. I'm left with having to deal with the economic problems.

I will deal with those economic problems whichever way I have to, and my options are fairly well clear at this point.

Again, I don't believe what you're proposing here is going to solve the problems in the long term because of what I've stated, and I hope the EPA can find some way to resolve this with the PRP's that will handle it much better long term for both environment and safety of the health of the residents.

Thank you.

MR. HUEBNER: Thank you. Before you -- William, before you leave, does anybody have any questions?

(No response.)

MR. HUEBNER: Okay. The next person that indicated that they wished to speak, and please excuse me for pronouncing your last name wrong, Alan Simard.

MR. SIMARD: Simard.

MR. HUEBNER: Sorry.

MR. SIMARD: I'm Alex Simard. I'm one of the owners of Whispering Pines Mobile Home Village which is on the north of the site.

We also own -- we own a total of 240 acres to the north and the east of the Auburn Road landfill, and there's 253 residents that live there, so we have a lot of concern about the clean-up at the Auburn Road landfill.

Now, I don't agree, either, that the proposed solution, SC-2, mainly the storage of the hazardous material there, is a solution.

I feel that much better solution is the incineration of the waste, SC-5. I feel that SC-2 is just going to -- in the future, we're going to have more problems. We're going to be back in the same situation we have now.

Also, as far as the groundwater clean-up, we want both the soils and the groundwater to be cleaned up on and off site, and we feel that MM-2 bringing a sewer line in and disposing of the water and any materials in it, would be a more effective solution rather than MM-1.

I guess that's all the comments I have for the night.

MR. HUEBNER: Okay. Thank you. Any questions?

(No response.)

MR. HUEBNER: Thank you. Jim Kohler?

MR. KOHLER: Thank you. I'd like to thank EPA and the state for giving me the opportunity to make a presentation tonight.

I've been designated as spokesperson for a number of the parties who are alleged by EPA to be potentially responsible for cleaning up the Auburn Road landfill.

Our group has engaged Canonie Environmental Services Corporation, a nationally renowned engineering firm, to carefully review the feasibility study and other reports relative to the site.

Because of the very short time available to us to date, we're only able to raise some questions tonight concerning EPA's report, but we are in the process of preparing detailed comments on several issues which we hope EPA will carefully consider prior to completing its record of decision.

My first point is the report specifically recommends against soil flushing through the solid waste areas because it would exacerbate contamination of the aquifer.

We are puzzled about why the proposed remedy disregards this recommendation in the initial report.

The second point is before any remedy is selected, additional groundwater monitoring must be done because the data relied upon by EPA is at least two years old and because much of the pertinent data is conceded in the report to be questionable.

The plume, as described in the report, is not defined on the basis of correlative sampling, but rather on a sporadic and isolated high points.

Before effective remediation can take place, the plume must be accurately defined. The extraction wells which are presently proposed did not appear to be intersecting the contaminant plume as defined in the report.

When available groundwater data is plotted, clean-up target levels appears to be already met on the sits. Therefore, we question why EPA proposes to treat groundwater and soil flush where target levels are already met.

There also appears to be a significant number of contaminants found off site which have not been found in on-site sampling. The data fails to show any correlation between these off-site contaminants and any occurrence on the site at any time.

The extractability of the groundwater from the overburden and from bedrock must be determined prior to initiation of remedial action.

In other New England Superfund sites. bedrock aquifers were not treated because of the recognized futility of trying to cover groundwater from the bedrock aquifer.

Hydrogeologic data must be presented to show that the recovery of groundwater from the bedrock is feasible -- I mean, I should say recovery and treatability.

The EPA's preferred alternative suggests that the coagulation and precipitation unit is being designed specifically for arsenic removal.

At least two concerns should be raised. Target or background levels for arsenic appear to be already met and, more importantly, the viability of arsenic to target levels with this process is doubtful.

Therefore, the feasibility of coagulation and precipitation or metal hydroxide precipitation as it's called should be re-examined.

5. The review should be done with respect to the feasibility of discharging pretreated groundwater to sewer line extension.

Again, these concerns are the result of our preliminary review, and further points may be identified as our experts continue their ongoing review of the reports.

The seriousness of these concerns demonstrates the need for a more indepth technical review by experts and adequate time to conduct such a review.

Therefore, we believe additional time for public comments is necessary.

Thank you.

MR. HUEBNER: Thank you, Jim. Any questions?

(No response.)

MR. HUEBNER: Thank you. Did anybody else wish to make a statement that's here this evening? Richard Pease, from the State of New Hampshire?

MR. PEASE: My name is Richard Pease. I'm with the New Hampshire Department of Environmental

Services.

We've been involved in the process all along providing managerial assistance, and our department has reviewed the feasibility study and submitted comments to the feasibility study.

The department concurs with the EPA proposed plan. We are willing to provide any assistance necessary to the Town of Londonderry Sewer Commission or the Manchester Water Works to further come to an agreement on discharge to the Manchester POTW, and we'll continue to provide assistance to the EPA to evaluate that alternative.

MR. HUEBNER: Any questions of Richard?

(No response.)

MR. HUEBNER: Okay. Anybody else?

MR. KOHLER: I have a question, Dennis, just on the basis of what was said tonight, and this is strictly from my company perspective, not from the PRP's.

I was concerned about the statement tonight that we're going to pump 200 or 250 gallons per minute of groundwater. I think that was the first time that I had heard or read that pumping rate.

If you look at the hydrogeology of the

site, especially where almost all the extraction wells are going to be, and you take into account the amount of groundwater extractions -- bedrock in this area, just by a simple review of the bedrock wells in the area and their yield, you're going to see that -- I would say that 95 percent of the groundwater that you're going to treat through that site is going to come from an off-site location and that the -- I'm not really sure what we hope to accomplish by putting these -- well sites on line.

Further, I don't know if there's any other data to show that you can even pump 200, 250 gallons a minute with the exception of locating in the bedrock trough, wells there off the site.

So the point I'm trying to make here is we're predicting pumping rates of 200, 250 gallons a minute, and yet the hydrogeology of the site and the extraction wells on the site are very limited as to where you're going even be able to get that amount of water.

I just seem to think here we're putting the cart before the horse in the study. We're making predictions on how much we're going to pull out of the groundwater before any feasibility is done as far as percentage yield versus -- on site versus even off site.

If the case is that you can't get the water off site, why are you pumping it all the way -- why don't you treat it off site? Why are we bringing it all the way back on the site?

I think a lot of work needs to be done in the hydrogeologic area before we go ahead and move ahead with any type of proposal of pumping and treating on the engineering basis.

Thank you. Maybe I should put that in the form of a question. Is there something that will substantiate that?

MR. HUEBNER: Well, let me ask, was the statement -- did he hear what you were saying correctly, Chet? Okay. That is something that we will address.

We're not going to try to respond to it right now. Does anybody else wish to comment?

(No response.)

MR. HUEBNER: Okay. This concludes the public hearing. I thank you for coming. EPA staff will remain here for a few minutes.

If any of you wish to talk to someone, I would encourage you to do so.

Thank you.

(Whereupon, at 9:15 p.m., April 25, 1989, the above matter was concluded.)

CERTIFICATE OF REPORTER AND TRANSCRIBER

This is to certify that the attached proceedings before: U.S. ENVIRONMENTAL PROTECTION AGENCY, in the Matter of:

AUBURN ROAD SUPERFUND SITE

Place: Londonderry, New Hampshire

Date: April 25, 1989

were held as herein appears, and that this is the true, accurate and complete transcript prepared from the notes and/or recordings taken. of the above entitled proceeding.

V. Rasmussen Reporter	5/2/89 Date
S. Hayes Transcriber	5/2/89 Date

ATTACHMENT D

RESPONSE TO COMMENT
B.2.g of SECTION III

e: 11-3A
rnative Number: MM-3A
rnative: Groundwater Collection/Discharge to Sewer
(including off-site groundwater)
Number: 306
Name: Auburn Road

PRESENT WORTH COSTS
Date: 23-Jun-89
Time: 16:21

Item Description	Units	Quantity	Unit Price $	Total Cost $
JIPMENT AND SUPPLIES (275 gpm)				
Process Equipment	ls	1	$232,709	$232,709
Storage Tanks	ls	1	$109,608	$109,608
Pumps & Blowers	ls	1	$45,990	$45,990
UIPMENT INSTALLATION (35 % of equipment cost)	ls	1	135,908	$135,908
RVICES COSTS (inc. instrumentation, piping, electrical, etc. @ 90 % of installed equipment cost)	ls	1	471,794	$471,794
REATABILITY STUDY	ls	1	100,000	$100,000
EWER HOOK-UP				
Sewer Main	l.f.	[illegible]	70	$560,000
Pump Station	ls	1	161,971	$162,000
ROUNDWATER RECOVERY SYSTEM				
Well Installation (Overburden)	well	[illegible]	5,000	$140,000
Well Installation (Bedrock)	well	[illegible]	17,500	$490,000
Trench Installation (inc. pumps,piping,etc)	l.f.	[illegible]	150	$270,000
OTAL CAPITAL				$2,718,009
ontractor Fee (10%)				$271,801
egal Fees, Licensing, Permits (10%)				$271,801
ngineering Administration (15%)				$407,701
Subtotal				$3,669,312
Contingency (10%)				$366,931
TOTAL CAPITAL				$4,036,243
Present Worth of O&M Costs				$12,104,469
TOTAL ALTERNATIVE COST				$16,140,712

Table: 11-3A
Alternative Number: MM-3A
Alternative: Groundwater Collection/Discharge to Sewer
(including off-site groundwater)
Site Number: 306
Site Name: Auburn Road

PRESENT WORTH COSTS
Date: 23-Jun-89
Time: 16:21

ITEM DESCRIPTION	Units	Quantity	Unit Price $	Total Annual Cost $	Operation Time Yrs	Present Worth $
GROUNDWATER MONITORING						
Sampling	hr	240	$35.00	$8,400	30	$129,129
Equipment	day	8	$150.00	$1,200	30	$18,447
Shipping	sample	40	$33.33	$1,333	30	$20,497
Analysis	sample	40	$2,500.00	$100,000	30	$1,537,245
Validation	hr	120	$60.00	$7,200	30	$110,682
AIR STRIPPING O&M						
Labor	hr	17,520	$25.00	$438,000	10	$3,382,129
Chemicals						
Polymer	lbs	17,520	$3.75	$65,700	10	$507,318
Lime	ton	144	$80.00	$11,520	10	$88,954
H2SO4	ton	16	$220.00	$3,520	10	$27,181
Carbon	lbs	80,760	$1.00	$80,760	10	$623,607
Maintenance	ls	1	$121,087.29	$121,087	10	$935,004
Power	kw-hr	373,333	$0.08	$29,867	10	$230,622
Sewer Use Fee	1000 gal	143444	$2.85	$409,442	10	$3,161,606
Sample & Analysis	sample	12	$2,500.00	$30,000	10	$231,652
SUBTOTAL				$1,308,030		$11,004,063
CONTINGENCY - Cost Based on 10% of Subtotal				$130,803		$1,100,406
TOTAL				$1,438,833		$12,104,469

11-3
ive Number: MM-3
ive: Groundwater Collection/Discharge to Sewer
ber: 346
e: Auburn Road

PRESENT WORTH COSTS
Date: 23-Jun-89
Time: 15:29

Item Description	Units	Quantity	Unit Price $	Total Cost $
NT AND SUPPLIES (100 gpm)				
ess Equipment	ls	1	$88,003	$88,003
age Tanks	ls	1	$41,450	$41,450
s & Blowers	ls	1	$17,392	$17,392
NT INSTALLATION % of equipment cost)	ls	1	51,396	$51,396
S COSTS . instrumentation, piping, trical, etc. @ 90 % of talled equipment cost)	ls	1	178,418	$178,418
BILITY STUDY	ls	1	100,000	$100,000
HOOK-UP				
er Main	l.f.	[illegible]	55	$440,000
p Station	ls	1	20,000	$20,000
WATER RECOVERY SYSTEM				
l Installation (Overburden)	well	20	5,000	$100,000
l Installation (Bedrock)	well	20	17,500	$350,000
nch Installation inc. pumps,piping,etc)	l.f.	1800	150	$270,000
				$1,656,660
CAPITAL				
				$165,666
ctor Fee (10%)				$165,666
Fees, Licensing, Permits (10%)				$248,499
ering Administration (15%)				
				$2,236,490
tal				
				$223,649
gency (10%)				
				$2,460,140
CAPITAL				
				$4,746,228
nt Worth of O&M Costs				
				$7,206,367
ALTERNATIVE COST				

Table: 11-3
Alternative Number: MM-3
Alternative: Groundwater Collection/Discharge to Sewer
Site Number: 346
Site Name: Auburn Road

PRESENT WORTH COSTS
Date: 23-Jun-89
Time: 15:29

ITEM DESCRIPTION	Units	Quantity	Unit Price $	Total Annual Cost $	Operation Time Yrs	Present Worth $
GROUNDWATER MONITORING						
Sampling	hr	240	$35.00	$8,400	30	$129,129
Equipment	day	8	$150.00	$1,200	30	$18,447
Shipping	sample	40	$33.33	$1,333	30	$20,497
Analysis	sample	40	$2,500.00	$100,000	30	$1,537,245
Validation	hr	120	$60.00	$7,200	30	$110,682
AIR STRIPPING O&M						
Labor	hr	5,840	$25.00	$146,000	10	$1,127,373
Chemicals						
Polymer	lbs	2,190	$3.75	$8,213	10	$63,415
Lime	ton	18	$80.00	$1,440	10	$11,119
H_2SO_4	ton	2	$220.00	$440	10	$3,398
Carbon	lbs	10,095	$1.00	$10,095	10	$77,951
Maintenance	ls	1	$73,806.19	$73,806	10	$569,896
Power	kw-hr	46,667	$0.08	$3,733	10	$28,828
Sewer Use Fee	1000 gal	17500	$2.85	$49,875	10	$385,122
Sample & Analysis	sample	12	$2,500.00	$30,000	10	$231,652
SUBTOTAL				$441,733		$4,314,752
CONTINGENCY - Cost Based on 10% of Subtotal				$44,173		$431,475
TOTAL				$485,907		$4,746,228

Table Number: IV-2
Alternative Number: MM-3
Alternative: Groundwater Collection/Discharge to Sewer
Site Number: 386
Site Name: Auburn Road

COST COMBINATION PERMUTATIONS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
EQUIP/SUPPLIES/INSTALLATION	1	2	3	1	1	1	2	2	2	3	3	3	1	1	1	2	2	2	3	3	3
SERVICES COSTS	1	2	3	1	1	2	1	2	2	1	3	3	1	1	3	3	2	2	3	3	2
GROUNDWATER RECOVERY SYSTEM	1	2	3	1	2	2	1	1	2	1	1	3	1	3	3	3	3	2	3	2	2
PW O&M COST INTEREST RATE	1	2	3	2	2	2	1	1	1	1	1	1	3	3	3	3	3	3	2	2	2

ESTIMATED COSTS AND PERCENT VARIATION

Item	Cost	Max %	Min %
1. EQUIP/SUPPLIES/INSTALLATION	198,242	25%	25%
2. SERVICES COSTS	178,418	25%	25%
3. GROUNDWATER RECOVERY SYSTEM	720,000	100%	50%
4. PW O&M COST INTEREST RATE	5%	3%	10%

COMPUTED RANGES

Item	Cost	Max	Min
1. EQUIP/SUPPLIES/INSTALLATION	198,242	247,802	148,681
2. SERVICES COSTS	178,418	223,023	133,814
3. GROUNDWATER RECOVERY SYSTEM	720,000	1,440,000	360,000
4. PW O&M COST INTEREST RATE	4,746,228	6,051,616	2,910,550

STATISTICAL PARAMETERS

SUMMATION	[illegible]
POPULATION	[illegible]
DEGREES OF FREEDOM	[illegible]
BASE	[illegible]
MEAN	[illegible]
MAXIMUM COST	9,720,790
MINIMUM COST	4,696,255
STANDARD DEVIATION	1,756,096
COEFFICIENT OF VARIANCE	0.24
UPPER LIMIT (50%)	8,393,169
LOWER LIMIT (50%)	6,022,440

lumber: IV-2
ative Number: MM-3
ative: Groundwater Collection/Discharge to Sewer
umber: 386
ame: Auburn Road

COMBINATION COSTS - SENSITIVITY ANALYSIS
Date: 23-Jun-89
Time: 16:05

COST ITEMS	BASE	1	2	3	4	5	6	7	8	9	10	11
/SUPPLIES/INSTALLATION	198,242	198,242	247,802	148,681	198,242	198,242	198,242	247,802	247,802	247,802	148,681	148,681
CES COSTS	178,418	178,418	223,023	133,814	178,418	178,418	223,023	178,418	223,023	223,023	178,418	133,814
ABILITY STUDY	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
: HOOKUP	460,000	460,000	460,000	460,000	460,000	460,000	460,000	460,000	460,000	460,000	460,000	460,000
IDWATER RECOVERY SYSTEM	720,000	720,000	1,440,000	360,000	720,000	1,440,000	1,440,000	720,000	720,000	1,440,000	720,000	720,000
)TAL CAPITAL COST	1,656,660	1,656,660	2,470,825	1,202,495	1,656,660	2,376,660	2,421,264	1,706,220	1,750,825	2,470,825	1,607,099	1,562,495
ractor Fee (10%)	165,666	165,666	247,082	120,249	165,666	237,666	242,126	170,622	175,082	247,082	160,710	156,249
l Fees, Licensing, Permits (10%)	165,666	165,666	247,082	120,249	165,666	237,666	242,126	170,622	175,082	247,082	160,710	156,249
neering Administration (15%)	248,499	248,499	370,624	180,374	248,499	356,499	363,190	255,933	262,624	370,624	241,065	234,374
OTAL	2,236,491	2,236,491	3,335,614	1,623,368	2,236,491	3,208,491	3,268,707	2,303,397	2,363,614	3,335,614	2,169,584	2,109,368
INGENCY	223,649	223,649	333,561	162,337	223,649	320,849	326,871	230,340	236,361	333,561	216,958	210,937
L CONSTRUCTION COSTS	2,460,140	2,460,140	3,669,175	1,785,705	2,460,140	3,529,340	3,595,578	2,533,737	2,599,975	3,669,175	2,386,543	2,320,305
&M COST	4,746,228	4,746,228	6,051,616	2,910,550	6,051,616	6,051,616	6,051,616	4,746,228	4,746,228	4,746,228	4,746,228	4,746,228
L PRESENT WORTH	7,206,368	7,206,368	9,720,790	4,696,255	8,511,755	9,580,955	9,647,193	7,279,965	7,346,203	8,415,403	7,132,771	7,066,533

COST ITEMS	BASE	12	13	14	15	16	17	18	19	20	21
IP/SUPPLIES/INSTALLATION	198,242	148,681	198,242	198,242	198,242	247,802	247,802	247,802	148,681	148,681	148,681
VICES COSTS	178,418	133,814	178,418	178,418	133,814	133,814	223,023	223,023	133,814	133,814	223,023
ATABILITY STUDY	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
ER HOOKUP	460,000	460,000	460,000	460,000	460,000	460,000	460,000	460,000	460,000	460,000	460,000
UNDWATER RECOVERY SYSTEM	720,000	360,000	720,000	360,000	360,000	360,000	360,000	1,440,000	360,000	1,440,000	1,440,000
TOTAL CAPITAL COST	1,656,660	1,202,495	1,656,660	1,296,660	1,252,055	1,301,616	1,390,825	2,470,825	1,202,495	2,282,495	2,371,704
ntractor Fee (10%)	165,666	120,249	165,666	129,666	125,206	130,162	139,082	247,082	120,249	228,249	237,170
gal Fees, Licensing, Permits (10%)	165,666	120,249	165,666	129,666	125,206	130,162	139,082	247,082	120,249	228,249	237,170
gineering Administration (15%)	248,499	180,374	248,499	194,499	187,808	195,242	208,624	370,624	180,374	342,374	355,756
BTOTAL	2,236,491	1,623,368	2,236,491	1,750,491	1,690,275	1,757,181	1,877,614	3,335,614	1,623,368	3,081,368	3,201,800
NTINGENCY	223,649	162,337	223,649	175,049	169,027	175,718	187,761	333,561	162,337	308,137	320,180
TAL CONSTRUCTION COSTS	2,460,140	1,785,705	2,460,140	1,925,540	1,859,302	1,932,900	2,065,375	3,669,175	1,785,705	3,389,505	3,521,980
O&M COST	4,746,228	4,746,228	2,910,550	2,910,550	2,910,550	2,910,550	2,910,550	2,910,550	6,051,616	6,051,616	6,051,616
TAL PRESENT WORTH	7,206,368	6,531,933	5,370,690	4,836,090	4,769,852	4,843,449	4,975,925	6,579,725	7,837,320	9,441,120	9,573,596

Table Number: IV-2A
Alternative Number: MM-3A
Alternative: Groundwater Collection/Discharge to Sewer
Site Number: 386
Site Name: Auburn Road

COST COMBINATION PERMUTATIONS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
EQUIP/SUPPLIES/INSTALLATION	1	2	3	1	1	1	2	2	2	3	3	3	1	1	1	2	2	2	3	3	3
SERVICES COSTS	1	2	3	1	1	2	1	2	2	1	3	3	1	1	3	3	2	2	3	3	2
GROUNDWATER RECOVERY SYSTEM	1	2	3	1	2	2	1	1	2	1	1	3	1	3	3	3	3	2	3	2	2
PW O&M COST INTEREST RATE	1	2	3	2	2	2	1	1	1	1	1	1	3	3	3	3	3	3	2	2	2

ESTIMATED COSTS AND PERCENT VARIATION

Item	Cost	Max %	Min %
1. EQUIP/SUPPLIES/INSTALLATION	524,215	25%	25%
2. SERVICES COSTS	471,794	25%	25%
3. GROUNDWATER RECOVERY SYSTEM	900,000	100%	50%
4. PW O&M COST INTEREST RATE	5%	3%	10%

COMPUTED RANGES

Item	Cost	Max	Min
1. EQUIP/SUPPLIES/INSTALLATION	524,215	655,269	393,161
2. SERVICES COSTS	471,794	589,743	353,846
3. GROUNDWATER RECOVERY SYSTEM	900,000	1,800,000	450,000
4. PW O&M COST INTEREST RATE	12,104,469	15,433,644	7,422,876

STATISTICAL PARAMETERS

SUMMATION	334,165,76[illegible]
POPULATION	21
DEGREES OF FREEDOM	2[illegible]
MEDIAN	16,[illegible]40,7[illegible]3
MEAN	15,9[illegible]2,65[illegible]
MAXIMUM COST	21,176,156
MINIMUM COST	10,421,101
STANDARD DEVIATION	3,817,397
COEFFICIENT OF VARIANCE	0.24
UPPER LIMIT (50%)	18,489,399
LOWER LIMIT (50%)	13,335,913

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Number: IV-2A
native Number: MM-3A
native: Groundwater Collection/Discharge to Sewer
Number: 386
Name: Auburn Road,

COMBINATION COSTS - SENSITIVITY ANALYSIS
Date: 23-Jun-89
Time: 15:51

COST ITEMS	BASE	1	2	3	4	5	6	7	8	9	10	11
IP/SUPPLIES/INSTALLATION	524,215	524,215	655,269	393,161	524,215	524,215	524,215	655,269	655,269	655,269	393,161	393,161
VICES COSTS	471,794	471,794	589,743	353,846	471,794	471,794	589,743	471,794	589,743	589,743	471,794	353,846
ATABILITY STUDY	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
ER HOOKUP	722,000	722,000	722,000	722,000	722,000	722,000	722,000	722,000	722,000	722,000	722,000	722,000
JNDWATER RECOVERY SYSTEM	900,000	900,000	1,800,000	450,000	900,000	1,800,000	1,800,000	900,000	900,000	1,800,000	900,000	900,000
TOTAL CAPITAL COST	2,718,009	2,718,009	3,867,011	2,019,007	2,718,009	3,618,009	3,735,958	2,849,063	2,967,011	3,867,011	2,586,955	2,469,007
tractor Fee (10%)	271,801	271,801	386,701	201,901	271,801	361,801	373,596	284,906	296,701	386,701	258,696	246,901
al Fees, Licensing, Permits (10%)	271,801	271,801	386,701	201,901	271,801	361,801	373,596	284,906	296,701	386,701	258,696	246,901
ineering Administration (15%)	407,701	407,701	580,052	302,851	407,701	542,701	560,394	427,359	445,052	580,052	388,043	370,351
TOTAL	3,669,312	3,669,312	5,220,465	2,725,659	3,669,312	4,884,312	5,043,543	3,846,235	4,005,465	5,220,465	3,492,390	3,333,159
TINGENCY	366,931	366,931	522,047	272,566	366,931	488,431	504,354	384,623	400,547	522,047	349,239	333,316
AL CONSTRUCTION COSTS	4,036,244	4,036,244	5,742,512	2,998,225	4,036,244	5,372,744	5,547,897	4,230,858	4,406,012	5,742,512	3,841,629	3,666,475
O&M COST	12,104,469	12,104,469	15,433,644	7,422,876	15,433,644	15,433,644	15,433,644	12,104,469	12,104,469	12,104,469	12,104,469	12,104,469
AL PRESENT WORTH	16,140,713	16,140,713	21,176,156	10,421,101	19,469,887	20,806,387	20,981,541	16,335,327	16,510,481	17,846,981	15,946,098	15,770,944

COST ITEMS	BASE	12	13	14	15	16	17	18	19	20	21
UIP/SUPPLIES/INSTALLATION	524,215	393,161	524,215	524,215	524,215	655,269	655,269	655,269	393,161	393,161	393,161
RVICES COSTS	471,794	353,846	471,794	471,794	353,846	353,846	589,743	589,743	353,846	353,846	589,743
EATABILITY STUDY	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
WER HOOKUP	722,000	722,000	722,000	722,000	722,000	722,000	722,000	722,000	722,000	722,000	722,000
ROUNDWATER RECOVERY SYSTEM	900,000	450,000	900,000	450,000	450,000	450,000	450,000	1,800,000	450,000	1,800,000	1,800,000
UBTOTAL CAPITAL COST	2,718,009	2,019,007	2,718,009	2,268,009	2,150,061	2,281,114	2,517,011	3,867,011	2,019,007	3,369,007	3,604,904
ontractor Fee (10%)	271,801	201,901	271,801	226,801	215,006	228,111	251,701	386,701	201,901	336,901	360,490
egal Fees, Licensing, Permits (10%)	271,801	201,901	271,801	226,801	215,006	228,111	251,701	386,701	201,901	336,901	360,490
ngineering Administration (15%)	407,701	302,851	407,701	340,201	322,509	342,167	377,552	580,052	302,851	505,351	540,736
UBTOTAL	3,669,312	2,725,659	3,669,342	3,061,812	2,902,582	3,079,504	3,397,965	5,220,465	2,725,659	4,548,159	4,866,620
ONTINGENCY	366,931	272,566	366,931	306,181	290,258	307,950	339,797	522,047	272,566	454,816	486,662
OTAL CONSTRUCTION COSTS	4,036,244	2,998,225	4,036,244	3,367,994	3,192,840	3,387,455	3,737,762	5,742,512	2,998,225	5,002,975	5,353,282
W O&M COST	12,104,469	12,104,469	7,422,876	7,422,876	7,422,876	7,422,876	7,422,876	7,422,876	15,433,644	15,433,644	15,433,644
OTAL PRESENT WORTH	16,140,713	15,102,694	11,459,119	10,790,869	10,615,716	10,810,331	11,160,638	13,165,388	18,431,869	20,436,619	20,786,926

ATTACHMENT E

RESPONSE TO COMMENT 1.r. of ATTACHMENT B

Table Number: IV-1
Alternative Number: MM-2
Alternative: Groundwater Collection/On-Site Treatment
Site Number: 386
Site Name: Auburn Road

COST COMBINATION PERMUTATIONS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
MOB/DEMOB/SITE PREP	1	2	3	1	1	1	2	2	2	3	3	3	1	1	1	2	2	2	3	3	3
EQUIPMENT AND SUPPLIES	1	2	3	1	1	2	1	2	2	1	3	3	1	1	3	3	2	2	3	3	2
DEWATERING OF SOURCE AREAS	1	2	3	1	2	2	1	1	2	1	1	3	1	3	3	3	3	2	3	2	2
PW O&M COST INTEREST RATE	1	2	3	2	2	2	1	1	1	1	1	1	3	3	3	3	3	3	2	2	2

ESTIMATED COSTS AND PERCENT VARIATION

Item	Cost	Max %	Min %
1. EQUIP/SUPPLIES/INSTALLATION	416,208	25%	25%
2. SERVICES COSTS	374,587	25%	25%
3. GROUNDWATER RECOVERY SYSTEM	790,000	100%	50%
4. PW O&M COST INTEREST RATE	5%	3%	10%

COMPUTED RANGES

Item	Cost	Max	Min.
1. MOB/DEMOB/SITE PREP	416,208	520,260	312,156
2. EQUIPMENT AND SUPPLIES	374,587	468,234	280,941
3. DEWATERING OF SOURCE AREAS	790,000	1,580,000	395,000
4. PW O&M COST INTEREST RATE	4,878,801	6,220,651	2,991,848

STATISTICAL PARAMETERS

SUMMATION	174,027,655
POPULATION	21
DEGREES OF FREEDOM	20
BASE	[illegible]
MEAN	8,287,031
MAXIMUM COST	11,081,790
MINIMUM COST	5,506,097
STANDARD DEVIATION	1,860,978
COEFFICIENT OF VARIANCE	0.22
UPPER LIMIT (50%)	9,543,192
LOWER LIMIT (50%)	7,030,871

lumber: IV-1
ative Number: MM-2
ative: Groundwater Collection/On Site Treatment
umber: 386
ame: Auburn Road

COMBINATION COSTS - SENSITIVITY ANALYSIS
Date: 23-Jun-89
Time: 15:33

COST ITEMS	BASE	1	2	3	4	5	6	7	8	9	10	11
/SUPPLIES/INSTALLATION	416,208	416,208	520,260	312,156	416,208	416,208	416,208	520,260	520,260	520,260	312,156	312,156
CES COSTS	374,587	174,587	468,234	280,941	374,587	374,587	468,234	374,587	468,234	468,234	374,587	280,941
ABILITY STUDY	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
E LABORATORY	605,000	605,000	605,000	605,000	605,000	605,000	605,000	605,000	605,000	605,000	605,000	605,000
DWATER RECOVERY SYSTEM	790,000	790,000	1,580,000	395,000	790,000	1,580,000	1,580,000	790,000	790,000	1,580,000	790,000	790,000
DTAL CAPITAL COST	2,285,796	2,285,796	3,273,495	1,693,097	2,285,796	3,075,796	3,169,443	2,389,848	2,483,495	3,273,495	2,181,744	2,088,097
ractor Fee (10%)	228,580	228,580	327,349	169,310	228,580	307,580	316,944	238,985	248,349	327,349	218,174	208,810
l Fees, Licensing, Permits (10%)	228,580	228,580	327,349	169,310	228,580	307,580	316,944	238,985	248,349	327,349	218,174	208,810
neering Administration (15%)	342,869	342,869	491,024	253,965	342,869	461,369	475,416	358,477	372,524	491,024	327,262	313,215
OTAL	3,085,824	3,085,824	4,419,218	2,285,681	3,085,824	4,152,324	4,278,747	3,226,294	3,352,718	4,419,218	2,945,354	2,818,931
INGENCY	308,582	308,582	441,922	228,568	308,582	415,232	427,875	322,629	335,272	441,922	294,535	281,893
L CONSTRUCTION COSTS	3,394,407	3,394,407	4,861,139	2,514,249	3,394,407	4,567,557	4,706,622	3,548,924	3,687,989	4,861,139	3,239,889	3,100,824
&M COST	4,878,801	4,878,801	6,220,651	2,991,848	6,220,651	6,220,651	6,220,651	4,878,801	4,878,801	4,878,801	4,878,801	4,878,801
AL PRESENT WORTH	8,273,207	8,273,207	11,081,790	5,506,097	9,615,057	10,788,207	10,927,273	8,427,725	8,566,790	9,739,940	8,118,690	7,979,624

COST ITEMS	BASE	12	13	14	15	16	17	18	19	20	21
IP/SUPPLIES/INSTALLATION	416,208	312,156	416,208	416,208	416,208	520,260	520,260	520,260	312,156	312,156	312,156
VICES COSTS	374,587	280,941	374,587	374,587	280,941	280,941	468,234	468,234	280,941	280,941	468,234
ATABILITY STUDY	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
SITE LABORATORY	605,000	605,000	605,000	605,000	605,000	605,000	605,000	605,000	605,000	605,000	605,000
UNDWATER RECOVERY SYSTEM	790,000	395,000	790,000	395,000	395,000	395,000	395,000	1,580,000	395,000	1,580,000	1,580,000
BTOTAL CAPITAL COST	2,285,796	1,693,097	2,285,796	1,890,796	1,797,149	1,901,201	2,088,495	3,273,495	1,693,097	2,878,097	3,065,390
ntractor Fee (10%)	228,580	169,310	228,580	189,080	179,715	190,120	208,849	327,349	169,310	287,810	306,539
gal Fees, Licensing, Permits (10%)	228,580	169,310	228,580	189,080	179,715	190,120	208,849	327,349	169,310	287,810	306,539
gineering Administration (15%)	342,869	253,965	342,869	283,619	269,572	285,180	313,274	491,024	253,965	431,715	459,809
BTOTAL	3,085,824	2,285,681	3,085,824	2,552,574	2,426,151	2,566,621	2,819,468	4,419,218	2,285,681	3,885,431	4,138,277
NTINGENCY	308,582	228,568	308,582	255,257	242,615	256,662	281,947	441,922	228,568	388,543	413,828
TAL CONSTRUCTION COSTS	3,394,407	2,514,249	3,394,407	2,807,832	2,668,766	2,823,283	3,101,414	4,861,139	2,514,249	4,273,974	4,552,105
O&M COST	4,878,801	4,878,801	2,991,848	2,991,848	2,991,848	2,991,848	2,991,848	2,991,848	6,220,651	6,220,651	6,220,651
TAL PRESENT WORTH	8,273,207	7,393,049	6,386,255	5,799,680	5,660,614	5,815,131	6,093,262	7,852,987	8,734,899	10,494,624	10,772,755

APPENDIX B

STATE CONCURRENCE LETTER

State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
OFFICE of the COMMISSIONER
6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095
603-271-3503
FAX 603-271-2867

ROBERT W. VARNEY
COMMISSIONER

GEORGE A. MOLLINEAUX, P.E.
ASSISTANT COMMISSIONER

September 26, 1989

Mr. Paul Keough
Acting Regional Administrator
USEPA, Region I
JFK Federal Building
Boston, MA 02203

Re: State of New Hampshire Concurrence Letter
Record of Decision (ROD) (September 1989)
Auburn Road Landfill Site
Londonderry, NH

Dear Mr. Keough:

The New Hampshire Department of Environmental Services has reviewed the above referenced Record of Decision (ROD) and is in agreement with the recommendations therein. The ROD is also consistent with the rules and Regulations of Applicable or Relevant and Appropriate State Requirements (ARARs). Furthermore, if the project utilizes the trust fund, the State will provide a 50 percent match (public site) and operational support for the project if state funds are available.

Sincerely,

Robert W. Varney,
Commissioner

RWV/MMP/jd/08490
cc: Michael A. Sills, Ph.D., P.E., DES-WMD
Carl W. Baxter, P.E., DES-WMEB
Geoffrey M. Huntington, NHAGO
Chester Janowski, USEPA-Region I
William Walsh - Rogalski, Esq., USPEA-Region 1

APPENDIX C

ADMINISTRATIVE RECORD INDEX

Not included.